



F 291  
.H11  
Copy 1

LIBRARY OF CONGRESS.

*Chap.* F 291

*Shelf* H 11

UNITED STATES OF AMERICA.





















# HEALTH AND PROFIT:

AS FOUND IN THE

HILLY PINE REGION

OF

GEORGIA & SOUTH CAROLINA.

TOGETHER WITH AN ACCOUNT OF ITS

HORTICULTURAL, AGRICULTURAL, AND  
MANUFACTURING RESOURCES,

AND THE

TOPOGRAPHY, GEOLOGY, BOTANY, AND CLIMATOLOGY  
OF THE REGION.

By S. E. HABERSHAM, M. D.

AUGUSTA, GA.:

PRINTED AT THE AUGUSTA PRESS BOOK AND JOB OFFICE.  
1869.





# P R E F A C E .

---

In presenting this little work to the public, the author has endeavored to embrace so much information upon the various subjects treated, as seemed necessary to elucidate the peculiarly remedial influences of this climate in Pulmonary Consumption and kindred diseases, and the great Agricultural, Horticultural, and Manufacturing advantages of the region, hoping by this means to attract the attention of those residents of northern States who are obliged, by reason of chest complaints, to make semi-annual changes to a more genial climate.

Whatever defects of style and matter may appear in part first, the author hopes the reader will overlook, since it is very difficult in the discussion of a purely medical subject to avoid technical terms, without sacrificing perspicuity.

To my professional brethren I will simply say, that as the work is intended more particularly for popular reading, I have avoided the discussion of the general question of climatic influence upon Pulmonary Phthisis, and have only expressed such views as are deemed important to the intelligent general readers.

To those friends and professional gentlemen who have kindly furnished the information conveyed in these pages, I take this opportunity of returning my sincere thanks.

S. E. HABERSHAM, M. D.

SUMMERVILLE, *near Augusta, Ga.*, June 3, 1869.





# INDEX.

## PART FIRST.

	<i>Page</i>
A General Description of the Sand Hill Region of South Carolina and Georgia.....	9
Winds and Soil.....	10
Fogs.....	11
Water.....	11
Temperature of Water.....	12
Coker Spring, at Aiken, S. C.....	12
Area of the Sand Hill Region in Georgia and South Carolina.	13
Surface Soil.....	13
Berries.....	14
Scuppernong Grape.....	14
Clay Soil.....	15
Weeds and Grasses.....	15
Roots.....	15
Yellow Pine.....	16
Few Reptiles.....	17
Productiveness of the Low Lands.....	17
Facilities of Transportation.....	18
Lespedeza Striata.....	19
Chemical Analysis.....	20

	<i>Page</i>
Health and Diseases.....	21
Healthfulness.....	21
Diseases of the Liver.....	23
Pulmonary Consumption.....	24
Causes of Exemption.....	25
Humidity as a Cause of Phthisis.....	26
Cold as a Cause of Phthisis.....	27
Habits and Customs of the Native Population in the Sand Hill Region of South Carolina and Georgia, with reference to their bearing upon Pulmonary Consumption.	31
A Protracted Residence Necessary to Experience the Full Benefit of the Climate.....	36
A Few Words in Relation to Dietetic and Hygienic Rules which should be Observed by Invalids Coming South.....	42
Fatty Food Sometimes Deleterious.....	47
Pulmonary Consumption a Curable Disease.....	50
Spontaneous Cure of Phthisis.....	56

## PART SECOND.

Climatology.....	65
Precipitation of Rain.....	66
Physical Geography.....	72
Geology.....	79
Botany.....	85

## PART THIRD.

Agricultural Resources.....	95
Ramie.....	99
Maize or Corn.....	105

	<i>Page</i>
Wheat.....	107
Rye.....	108
Oats.....	108
Barley.....	109
Cow Pea (Vicia).....	109
Roots.....	110
Sweet Potato.....	110
Irish Potato.....	111
Beets.....	112
Turnips.....	112
Phosphatic Deposits and Marl Beds.....	113
Fruit Culture—Peach.....	117
Grape Culture.....	119
Manufacturing Resources.....	128
Description of the Augusta Canal.....	131
Summerville, Richmond County, Ga.....	143



# HEALTH AND PROFIT:

AS FOUND IN THE

Hilly Pine Region of Georgia & South Carolina.

---

## PART FIRST.

### *A General Description of the Sand Hill Region of South Carolina and Georgia.*

The following pages treat of the "Sand Hill" region of South Carolina and Georgia. They have been written at the request of Northern friends of the writer, who appreciate properly the benefits to be derived by consumptives from the invigorating temperature of its dry and mild Winter climate.

Resembling in many respects the "Indian Summer" of New York and Pennsylvania, the temperature of this region does not depress the invalid by its cold, nor exercise, in the Spring, the enervating influence so much complained of by those who prolong their stay into the early Spring months of the regions farther South, along the coast or in the interior of Florida.



The coldest days are generally in the months of December and January, and it is seldom that the thermometer marks at sunrise lower than  $28^{\circ}$  or  $30^{\circ}$  Fah. So seldom, indeed, is ice formed at night, visible at the middle of the next day, that the occurrence excites the comments of the native residents.

Though the rain, on an average, falls annually nearly as deep as at other places along the "eastern slope"—say about thirty-seven inches—the inconvenience therefrom is not as great as might be supposed, inasmuch as the porous nature of the sandy soil enables it to absorb the falling water so rapidly that out-door exercise may be indulged in an hour or two after the storm clouds have cleared away.

### *Winds and Soil.*

The prevailing winds in Winter are also drying winds (being from the north, northwest, west, southwest, and south), which soon evaporate the little surface moisture, and thus the atmosphere soon parts with its humidity. This fact explains the reason why so little inconvenience is experienced from what would be considered severe cold in a damper climate, the sea coast, for instance, where there is much more humidity, and where a much less degree of cold is found to be uncomfortable. For the same reason, an eastern wind, so much complained of in other regions of the Atlantic slope, though charged always with a large amount of vapor of water from the ocean, in reaching the borders of these hills, parts with much of its vapor in a very short time. I have often seen heavy nimbus or rain clouds rise rapidly and threatening in the east, and driven rapidly before

the wind, disappear in a few hours, with only a few drops of rain, and producing but a temporary effect upon the wet-bulb thermometer.

### *Fogs.*

Fogs are of very rare occurrence, never lasting longer than an hour or two after sunrise, and seldom dense enough to obscure vision within two hundred yards. Five or six fogs in the Spring and Autumn are as many as ever occur; and I do not recollect to have seen more than three or four in the winter in a series of years.

### *Water.*

In consequence of the nature of the soil composing the Sand Hills, they may be likened to great natural filterers, which collect the rain and pass it through the pure sand to the stratum of clay beneath, which is the water-bearing bed of the Hills. Dr. Joseph Jones, formerly Chemist to the Georgia State Agricultural Society, now Professor of Chemistry, University of Louisiana, New Orleans, in alluding to the water of Turknett Spring, near Augusta, Georgia, from which the city is supplied with drinking water, says:

The specific gravity of this water is but very little greater than that of pure distilled water, being 1000.007 per cent. The solid residue left after evaporation equals only four and one-fourth grains (4.25) in the gallon of water. The solid residue is composed of salts of lime, magnesia, soda, potassa, and silica. The water also contains, in common with all spring water, carbonic acid gas.

This spring rises from the base of the hills upon which the delightful town of Summerville stands,

directly upon the Milledgeville road, and represents the character of all the springs in the Sand Hill region.

### *Temperature of Water.*

The temperature of the well and spring water varies from one to two degrees, but may be considered to obey the law which governs the temperature of all spring and well water below seventy to one hundred feet from the surface, viz: the mean yearly temperature of the atmosphere which, in this region, is about 64° Fah. This equable temperature of the springs may be attributed to the equal depth of the water-bearing clay beds. Water at this temperature is a most delightful assuager of the thirst, and by its purity assists very materially in depurating the blood of many ingredients which may be considered causes of disease, if permitted to remain in the system. The purity of the water of this region accounts for the exemption of its native inhabitants from calculus and kidney diseases generally, and, I have no doubt, in purifying the circulating fluid it also has a very powerful influence in eradicating malarial fevers from the system.

### *Coker Spring, at Aiken, S. C.*

The Coker Spring, at Aiken, S. C., may be taken as a type of all those in the Carolina hills, and resembles in every respect the waters of Turknett Spring, the analysis of which it corresponds to. If I recollect rightly, the temperature of this spring is exactly 64° Fah.

### *Area of the Sand Hill Region in Georgia and South Carolina.*

The area of the Sand Hill region, though very imperfectly defined on its northwestern and southeastern borders, in the States of South Carolina and Georgia, is comprised within a narrow belt or area, extending from the northeastern border of South Carolina to the southwestern border of Georgia, reaching a maximum elevation at Aiken, in the former State, and Summerville, in the latter, of nearly six hundred feet. The average width of this peculiar formation may be estimated in the two States to be about thirty miles, more or less. To the geologist it is an extremely interesting portion of the American continent, particularly as it lies between the primary and tertiary regions, separating distinctly these two geological regions. For more interesting data on this subject, see Part Second.

### *Surface Soil.*

The surface soil is sandy, covered with a thin vegetable mould, which soon blends with the gray and white sand below when disturbed by the plough, becoming unproductive after one or two years (without manure) in cotton and the cereals, yet always yielding a prolific crop of fruit, particularly the peach, nectarine, apricot, pomegranite, fig, pear and plum, of many varieties, from the delicious and juicy magnum bonum and green gage to the common damson and wild plums of the country (*Prunus Americana*); and (*P. Chicasa*) watermelons reach dimensions almost incredibly large to those not

familiar with the fact; while cantelopes, which are grown in great profusion, possess a flavor surpassed by none in the world.

### *Berries.*

Blackberries of both varieties—the black raspberry, strawberries, and whortleberries—are very abundant. The black raspberry is not indigenous, and requires cultivation.

### *Scuppernong Grape.*

The grape is indigenous to the country, of which the scuppernong is the most hardy and abundant producer, having never been known to fail in ripening its fruit, and is entirely exempt from those blights which, in other countries and regions of our own, have nearly destroyed the vine. Mr. Berckmans, a distinguished horticulturist and vine-grower, now residing near Augusta, in the Sand Hill region, whose nursery is well worth seeing, states that he has never known this vine to fail in a series of years. Its fruit is of a most delicious and peculiar flavor, and makes a wine of the best quality, surpassed by none other grown in America. Its rapidity of growth is so great that when once well rooted it will cover a large area of ground, and the amount of fruit produced from one vine is almost incredible. It is propagated from the root, never should be trimmed, and only requires trailing on arbors or trellises to ensure its full vigor and health. This grape was originally brought from North Carolina, but it is now the common grape of this region, and promises to supplant all others in the estimation of the vine-

growers of Georgia and Carolina. It may be propagated by layers without difficulty, and will, no doubt, become a most certain source of wealth to the region in which it flourishes.

### *Clay Soil.*

In some localities the clay (argillaceous sand) lies near the surface, overlaid with a mixture of decomposed vegetable matter and dark sand; and there the soil is both productive in cereals and cotton, retaining for some time the manure put upon it, and being of very easy cultivation.

### *Weeds and Grasses.*

Weeds and grasses are less annoying to the farmer than elsewhere, and are easily subdued by the plough; the corn being generally left to shift for itself after the month of July, and sometimes much earlier.

### *Roots.*

The sweet potato yields most abundantly in this soil; some of the roots grow to the size of six pounds, and a very common weight is from two to three pounds. Ruta-baga and other turnips produce good crops when manured from the barn yard or with bone dust, as do also beets, parsnips, carrots, salsify, radishes, etc. The delicious bur artichoke and asparagus yield early and luxuriantly. Strawberries and green peas ripen in the month of April, and are, in turn, succeeded by snap beans, early cabbages, and lettuce. These vegetables come into use at least six weeks earlier than in the Northern States; while the Irish potato is often dug in the



mouth of June. The early varieties of the peach, apple, and pear ripen in the early part of June, and apricots in the month of May.

There are other fruits which the careful horticulturist could produce in abundance, but, as they require care, and are now unremunerative, they are neglected.

### *Yellow Pine.*

On the sandy ridges, the natural growth is generally small and stunted, excepting the long leaved or yellow pine, which acquires large dimensions, thus affording a superabundance of material for fencing and building purposes, beside yielding, from the superiority of its wood, a large income to the possessor of a water power, who cuts it into lumber for the neighborhood, or ships it to the coast for foreign markets.

Near the water courses, of which there are many (for this, notwithstanding the sandy character of the soil, is a well-watered region), the trees grow luxuriantly, such as the beach, white oak, poplar, sycamore, maple, elm, hack berry, etc.

The beauty of the field and forest consists not in verdant grass, but in its stead we have flowers, bright and beautiful, and of delicious odor. The woods are particularly rich in flowering shrubs, and the fields in the various genera and species of the composite order of plants. The *Coriopsis* and *Crisopis*, *Nymphia* and *Cynthia*, *Liatris* and *Erigonum*, *Napthalia*, *Vernonia*, *Rudbeckia*, *Aster*, and *Gnaphalium*, and many others of this order, flourish in their beauty; while *Vaccinum Arborium*, whose

glossy green leaves contrast strongly with its luxuriant white flowers in nodding racemes, sometimes cover the branches so thickly as almost to obscure the foliage. Many of the Leguminoseae are very beautiful, but the pride of the woodland is the yellow Jessamine (*Gelsemium Semper-virens*), whose bright yellow petals are often seen hanging in thick clusters and festoons from the boughs and tops of medium sized trees, presenting a more beautiful appearance than can be equalled by the florist in a less favored climate; perfuming the atmosphere at early morn and evening with an odor unequalled in its fragrance.

### *Few Reptiles.*

In these woods and fields the student of natural history may find days of unalloyed pleasure, and wander for hours, unmindful of fatigue, amid the beauty of its flora, regardless of reptiles, of which there are very few, save on the banks of the streams where the shrubbery is too thick for pleasant walking. Even here, however, this cold-blooded enemy of our race is seldom seen, since he generally makes his escape at the noise of man's footfall.

### *Productiveness of the Low Lands.*

Though the soil of the hills and ridges is generally unproductive, save in fruit, as before mentioned, yet the lower lands bordering on the creeks and water courses yield abundant crops of wheat and maize, even with the careless system of cultivation practiced before emancipation; but, with the improved agriculture of the white man's own hands, cultivating

and manuring thoroughly a small portion of land at a time, there is no reason why labor should not be amply rewarded. I know that thirty bushels of wheat have been raised to the acre; the same land ploughed in when the wheat was removed, and twenty-five bushels of corn and ten of cow peas attained as a second crop.

When the proximity of the great marts of trade lying upon the Atlantic is recollected, with the great and increasing facilities of transportation taken into account, there is every reason to believe that the remuneration of capital and labor will be equal to that afforded by the rich alluvial lands of the Southwest and West, so abounding in cholera, malarial fever, etc. From these this region is generally exempt.

### *Facilities of Transportation.*

Regular lines of steamers from the ports of Savannah and Charleston twice a week, with railroad transportation to these ports, afford rapid carriage for early fruits and vegetables to the cities of New York, Boston, Philadelphia, and Baltimore, where they bring very remunerative prices, and must invite a ready sale. When the low price of land, the cheapness of building, the character of soil, rendering it very easy of cultivation, the little outlay of capital necessary to establish orchards and vineyards, are considered, the per centage upon capital invested is enormous.

Heretofore there has been comparatively little enterprise in this direction, cotton having absorbed the attention and available means of the more intel-

ligent portion of the people; but now that the unreliable nature of negro labor in large gangs, and the scarcity of money, have forcibly turned the attention of the planter to that kind of agriculture which will yield the greatest income upon small investments, the hope is indulged that before long this land, now neglected and wasted, will be covered with orchards and vineyards, and that each family will literally dwell under its own vine and fig tree.

### *Lespedeza Striata.*

Heretofore a great desideratum has been some herb or grass to cover the surface of lawns and afford grazing for cattle and sheep. Nature now seems miraculously to have supplied this want in the *Lespedeza Striata*, or Japan clover, as it has been named by the common consent of all. This growth is spreading, from apparently many centres, over the whole middle and up country of South Carolina and Georgia, with such astonishing rapidity as apparently to have been sown by the bountiful hand of heaven from the clouds. During and before the war it was only known to our botanists, and it is not described in either Elliott's or other Botany of the Southern States, and therefore could not have existed generally when these books were written. It is supposed by Professor Gray, I learn, to have been of Japanese origin, though it has been known for many years to Mr. H. W. Ravenel, of Aiken, S. C. The popular opinion is that it was brought into the country by Sherman in his march through, but it has been found very far from his line of march, and was known before he invaded these States. The scientific

attribute its rapid spread to some peculiar change in the climate and soil inexplicable with our present knowledge.

So rapid is its growth that whole regions of country, from the mountains to the Sand Hills, are being covered by it. It grows abundantly in the forest under-shade and in the sunny red clay, forming a vegetable mould for itself by the decay of its stem, to sprout out again in the Spring luxuriant and green; growing thickly when there is a vegetable mould, eradicating the common grasses which are of no value as forage, and killing the broom sedge. It is said even to give the nut grass a hard tug for existence, but this I can hardly credit. In some favorable localities it has been known to grow to the height of three feet, as stated by farmers, but it is generally not more than from four to ten inches high.

### *Chemical Analysis.*

An analysis of the *Lespedeza Striata* by Professor Rains, of the Augusta Medical School, shows it to be rich in potassa and soda, and very similar in its constituents to clover. It should, therefore, prove not only valuable for grazing, but also as a renovator of worn-out lands, for which it seems to have a wonderful fondness. Already, I learn, the cattle are showing the benefit they derive from it in their greatly improved flesh and sleek skins, as they are said to devour it with great avidity. A botanical description of this plant is given in the second part of this work, under the head of "Botany of this Region."

*Health and Diseases.*

After mentioning the many water courses of this Sand Hill region, I might be expected to feel some hesitation in asserting the remarkable and unsurpassed health and longevity of its inhabitants, but the rapid increase of its population from natural causes alone would support me, since there has been no immigration to it for years; while it has afforded a large surplus population for emigration to Alabama and the other Southwestern States. White, in his Statistics of Georgia, article Richmond County, gives the ages of some of the oldest inhabitants of this county. Page 506 :

Mr. D'Antignac died at the age of 89; Agnus Martin over 80; James Gardiner over 83; Mrs. Griffin over 90; Mrs. Dawson over 91; Mr. N. Murphy 80; Mr. Rowell over 80; Mrs. Tinley nearly 103. There are now living in Augusta, 1849, in the same family, four persons, each of whom has exceeded 83 years. In 1826, an African, known as old Orua, died on Mr. Course's plantation at the age of 96. Mr. Course had, within twenty-five years, buried twenty-nine Africans from the ages of 80 to 140 years. Old Amy died at 140. She arrived in Charleston when there were but six small houses; she retained her speech, her sight and hearing to the last. Jack Wright was 109 years old; he had been a servant of Lord Anson when stationed at Charleston, prior to his voyage round the world.

There are now living in this county many persons known to me, who are over 80 years of age.

*Healthfulness.*

Its elevation, character of soil, and vegetation, exempts it from malarial fevers, excepting in a few localities immediately in the neighborhood of mill ponds, or on the banks of the larger streams, where



the swamps widen out to some extent; even here it is seldom found to produce those high grades of congestive, bilious, remittent, and continued fevers so common in the same latitude elsewhere. Indeed, the character of the soil and the purity of the water seem inimical to the growth of those spores upon which malaria depends.

Typhoid fever and dysentery sometimes prevail in the Summer and Autumn season in sporadic cases, but are seldom fatal, excepting from neglect and imprudence in permitting the patient to indulge in solid articles of diet. In the years 1850, 1851, and 1852, there was an epidemic constitution of the atmosphere along the waters of the Edisto river, which seemed to be Typhoidal; for, upon a case having been brought into that section from Atlanta, Ga., in the person of a child eight years of age, it spread from place to place along that river; but so mild was the type that not a single patient died of forty occurring in the three years.

Pneumonia, Pleurisy, Bronchitis, and Catarrhal affections, generally, are more rare than in any other region I am acquainted with; for a physician in good practice for this region may pass through a whole Winter without seeing more than half a dozen cases of either of the first two, though bronchitis and nasal catarrh may occur here as elsewhere, from imprudence or exposure. These diseases always yield readily to treatment, rarely terminating unfavorably, excepting in extreme age, or from some great imprudence on the part of patient or friends; and this is rather to be wondered at, since the houses of the country are very open, exposing the patient to

draughts of cold air—perhaps at the very crisis of his disease. All catarrhal affections are sooner recovered from than in any other climate I have practiced in.

That character of acute articular Rheumatism so often seen in cities and damp climates is very seldom observed in this region. I remember to have seen but two cases in a practice of seven years which were at all severe. These appeared to be epidemic, having occurred in a boarding school, commencing in each case with inflammation of the eye, or catarrhal aphthemia, with sudden subsidence in the eye, and metastasis to the large joints. I know of no climate better adapted to the relief of chronic cases of this disease, and can recollect many cases which have been entirely relieved by a residence in it.

Calculous complaints, and diseases depending upon Lithic diathesis, are so rare that I do not recollect to have seen a case in the native population, or one which originated in the climate, during my residence in Aiken.

### *Diseases of the Liver.*

Diseases of the Liver sometimes originate here, though many persons have removed to the climate for relief, with removal of all the symptoms. Bilious derangements sometimes supervene upon errors in diet, and much exposure to the sun, in those unaccustomed to it. It is not, however, surprising that these diseases should occur, and the wonder is that they do not oftener appear, when the fatty diet of the people generally, who eat much greasy food, is considered.\*

---

\*This remark refers to the plain farmers of the country.

Anasarca or Ascites, and diseases of the circulatory apparatus, seldom trouble patient or physician.

Asiatic Cholera is never known to have occurred, and Cholera Infantum, the summer complaint of infants everywhere in America, only occurs here in a few isolated cases, and is generally of a mild character.

As a general thing, the healthfulness of the climate is as proverbial for children as for adults, as the number of large families will attest; there are many families which have never lost a child by disease.

Furthermore, I may say that no disease can be said to be endemic to the climate or soil, and those which do occur are more amenable to treatment than in any region I have ever been in, inasmuch as there are no endemic causes calculated to maintain diseased action; and the powers of nature, aided by judgment on the part of the medical attendant, conduct the patient to an almost sure and rapid recovery.

### *Pulmonary Consumption.*

Phthisis, or Pulmonary Consumption, is rarely known to originate among the native population, and when it does is of so chronic a character that the patients live on from year to year with apparently little discomfort. Dr. Amory Coffin, an old resident physician of Aiken, whose accurate diagnosis and familiarity with the disease, acquired by an extensive practice among the invalids who resort there for relief, remarked to me:

The wonder is not that so few cases do occur among the natives, but that those who do suffer from it live to a ripe old age, to die of some other disease, perhaps, essentially not Phthisical.

*Causes of Exemption.*

The peculiarly beneficial influence of this climate in Pulmonary Consumption may be attributable to its perfect healthfulness with respect to other diseases; the result in part of the dryness of the soil, the peculiar influence of the pine growth, its elevation above tide water, the absence of stagnant water and large water courses, the purity of the water, but more particularly the absence of humidity in the air and severe cold, as well as the habits and customs of the people. We, therefore, shall ask the attention of the reader while we consider seriatim the last named causes, as we deem it important in the discussion of this subject that all the points bearing upon it should be clearly stated, since it has been asserted by many that climate seems to exert but little direct influence as a cause of Phthisis, and that the habits and customs of a people are more directly concerned in its causation. The force of this assertion cannot be denied, for it seems sustained by facts, since we always find a comparative absence of the disease among a rural and sparse population, enjoying an abundance of food and domestic comforts, with out-door labor and exercise. In Hall county, Ga., where all of these conditions exist, a case of consumption was never known to have occurred. The accompaniments of civilization, refinement, and luxury, are far greater causes, certainly, of this malady, than mere climatic differences, excepting in so far as they modify the habits and customs of a people. There are, however, certain conditions of climate which are supposed,

upon physiological principles, to be directly causative of Phthisis; these are humidity and cold. We shall, therefore, consider

### *Humidity as a Cause of Phthisis.*

In estimating the influence of atmospheric humidity as an exciting cause of Pulmonary Consumption, we find a great discrepancy of opinion among writers on the subject, growing, no doubt, out of defective data from which their conclusions were drawn. The great difficulty of bringing men to think alike on any subject is proverbial. This is a defect of our mental organization, perhaps, and in no science is this more evident than in Medicine, expressed in the trite maxim that "doctors will disagree." In the absence of positive data, we are compelled to state our opinion, as based upon our own impressions, derived from observation, and the weight of medical evidence, which certainly accords to it a baneful influence upon the disease, both as an exciting and aggravating cause. This opinion is based upon the known physiological action of humidity upon the lungs and skin in diminishing the vaporous exhalation from these organs, thus rendering the blood more watery, and adding to that condition, which in the consumptive already exists in excess. Humidity also has a tendency to maintain the blood at an elevated temperature, as any one will observe who is unable to perspire when the thermometer stands at 90° Fab. This, however, is not the only evil resulting from humidity, since it also interferes, very materially, with the supplementary action of the skin in relation to the lungs. The im-

portance of this relation is so ably maintained by the most distinguished writers on Phthisis and climate, that I deem it only necessary to allude to it in this place. The effect of humidity is to enervate the body; and if it had no other evil influence upon the consumptive, this must be considered a serious one, since it would interfere with that exercise, so essential to healthy digestion and nutrition, the impairment of which is often the first step in the causation of Pulmonary Consumption. If we accept the above statements as facts, and they cannot be denied with our present physiological knowledge, we can readily understand one of the reasons for the healthfulness of the Sand Hill region of Georgia and Carolina, and more particularly their comparative exemption from Pulmonary Consumption and kindred diseases—since, from what has been said, it is essentially a dry climate.

### *Cold as a Cause of Phthisis.*

The effect of severe cold upon the animal organism is to depress the forces of the system by abstracting the animal heat more rapidly than it can be generated; and, as the first effect upon the lungs is to arrest transpiration, it very materially serves to impair the power of calorification, which process is mainly carried on in the lungs; being caused, as is supposed by Leibig, by the oxygen of the atmosphere acting upon the carbon of the blood, as it is exposed in the capillary net work of the pulmonary air tubes, causing a chemical combustion, and the conversion of the carbon in the blood into carbonic acid, which is expelled at each expiration. If this



be the first effect of severe cold, it must necessarily impair the vital capacity of the lungs so acted upon. Vital capacity signifies nothing more than the number of cubic inches of air which each individual can exhale in a forced expiration. Now, the relation between vital capacity and the process of calorification is such, that as one diminishes, so does the other. For example: an individual who can inhale, at a deep and full inspiration, three hundred and fifty cubic inches of air, will certainly generate more animal heat or personal warmth than one who can only inhale two hundred and fifty. Now, the influence of Pulmonary Consumption is to diminish, very materially, this vital capacity, as has been proven by many observations; hence, under all circumstances, a cold climate, particularly when associated with moisture, must be injurious to that person whose vital capacity has been thus reduced, since it would be impossible, from the nature of his defective respiration, and the watery condition of his blood, to supply the amount of animal heat necessary to maintain the integrity of his functions, as it has been shown by recent experiment and observation that a very small loss of animal heat will destroy life. The abstraction of even the smallest amount would materially diminish vital force so necessary to the performance of digestion and nutrition. I should, therefore, say that a patient whose vital capacity is materially reduced, should seek a climate adapted to his powers of calorification, and that in such a climate he would find the temperature best adapted to his case, particularly if it be a dry climate, which favors the supplementary action of the skin,



This hypothesis of the relation between animal heat and vital capacity is sustained by the thoracic dimensions of the Esquimaux, who, though but five feet in stature, has the thorax of a man six feet tall. On the other hand, the native of the torrid zone, though much taller, has a narrow and contracted chest, as described by travellers and observed by myself. This difference of thoracic conformation between the natives of the two thermal extremes is accounted for upon the supposition that the requirements of the Esquimaux are greater for animal heat than the native of the torrid zone, who generates more heat than he requires, which, if not carried off by profuse sweating, would consume him with fever; for it has been long shown that sweating is a cooling process, and that in a hot climate fever is always the result of a deficiency in this respect. There is another fact connected with the relation between functional activity of the lungs and vital capacity mentioned by travellers in the Andes, viz: that in consequence of the diminished oxygen in a given volume of atmosphere, by reason of the greatly rarified condition of the air at high altitudes, the thorax and vital capacity increase to meet this requirement of the system; and hence the supposed, and perhaps established, fact of the benefit resulting to the consumptive from a long sojourn in this region, independent of the equable temperature which must necessarily exist at 8,000 feet altitude in the torrid zone.

Taking the above facts into consideration, we can readily understand that if the stamina of an individual be sufficiently good to enable him to with-

stand the demands upon his power of calorification, that he would be materially benefitted by a change to a dry cold climate, such as St. Paul's, Canada, and other regions it is now the fashion to recommend to consumptives. Unfortunately, however, there are a very few consumptives who avail themselves of this climate before their vital capacity is materially reduced; and thus their power of calorification is so impaired as to be unable to supply the demands for this vitalizing principle, and functional, as well as organic, decay is the necessary consequence of the change to that climate.\* For such, a milder climate is better—sufficiently dry to favor cutaneous and pulmonary transpiration, and thus support the supplementary action of the skin, and sufficiently cool to enable the patient to take out-door exercise without the enervating effect of too much warmth. Such a climate we believe to exist in the sand hill region of Georgia and Carolina.

As before stated, climate probably exerts very little direct influence in the causation of Phthisis, farther than the mode and manner of life it engenders, and the daily hygrometric and thermal changes

---

\*Dr. J. Farrar, of St. Paul, Minnesota, writes to the *Hartford Courant*, warning consumptives, in the advanced stages of disease, against seeking relief in that State. The Doctor says: "A more changeable climate from one extreme to another I have never experienced in this country. The changes are more sudden, too, than they are in our New England States, thus making this climate totally unadapted to patients suffering with bronchial or catarrhal complaints, though hundreds are annually sent here by their physicians and friends for a relief or a cure of the above troublesome, and not unfrequently fatal, complaints. I have seen no evidence of the dryness of the air here in the interior of the State. I have yet to learn of a single instance wherein a patient with bronchial or catarrhal disease has been in the least benefitted by this climate. But, on the other hand, they are maladies continually originating in this State. Not a few such have consulted me in regard to their cases since my brief sojourn in St. Paul. I invariably send all such (or rather advise them) to spend the winter in South Carolina."

resulting from it. In order, therefore, to present this subject as fairly (to the consideration of medical men more particularly) as possible, and as my desire is not to claim more for our region than it is richly entitled to, lest I should be accused of exaggeration, I shall endeavor to represent the habits and customs of the native population as graphically as is consistent with truth and the plan of this work, since they bear an important relation to the subject.

*Habits and Customs of the Native Population in the Sand Hill Region of South Carolina and Georgia, with reference to their bearing upon Pulmonary Consumption.*

There is no region of the world, perhaps—New England not excepted—where the natives are more frugal and simple in their manner of living than are the farmers and well-to-do people of this region. Their diet, though plain, is amply nutritious to supply the demands of the system. Their clothing is sufficiently warm, though flannel is rarely worn by them. Their houses are built apparently with the view of admitting as much air as possible, and not to exclude it; seldom plastered, rarely ceiled over-head; the outer weather-boarding being the only protection against the inclemencies of the weather. The windows are constructed to admit light and air, since they are often not even closed with sash. Even in the coldest weather it is rare that the door is closed, excepting at night, when the family have retired, or the rain enters the house through it. A large fireplace, with a blazing fire, upon which the wood is piled in enormous quantities, seems to roast the

front, while the back is almost freezing. To one unaccustomed to such habits it is not only trying to the temper, but most inimical to health. These people seem not to feel the discomfort, and, what is most singular, never contract colds from the unequal heat of their bodies. Contrast this with the habit of the New England household, who are constrained (perhaps by the severity of their climate) to double their sashes, and close up their chimney with an air-tight stove, in addition to which the doors are listed, and only opened to afford ingress and egress to their sitting room. The first habit ensures a free ingress to a large amount of oxygen, at the expense of comfort to those unaccustomed to it; the other a dangerous diminution of this vital principle, with more temporary comfort—too sure in the end, however, to result disastrously to the occupants of such a dwelling, and which is, no doubt, one of the most positive causes of the great amount of Pulmonary disease common to the inhabitants of that region. The residents of these Hills are essentially an agricultural people, and by reason of the mildness of the climate are never forced to keep in doors, even in the most inclement weather.

The principal articles of diet are corn and wheaten bread, vegetables, and such flesh as they are enabled to rear themselves; and as the cows are only kept for milk, and sheep for wool, they are seldom killed; consequently, swine flesh and poultry enter very largely in their dietry, which is served up at every meal, viz: Breakfast, dinner, and supper. Their drink is simply cold water, and a very weak decoction of badly burnt coffee—Rio being generally pre-

ferred. Some few indulge habitually in the appetizing dram, though, unfortunately, this habit, I learn, has increased since the war. In the exemption from disturbing causes to create a restless night, they are generally sound sleepers; and having retired early, as is the custom of the people, they are early risers, and daylight finds them performing their customary ablutions preparatory to a day's work. They breakfast at sunrise, dine at meridian, and sup at dark. As all of their habits are such as to ensure a continuance of health, a plenty of free air, and with ample clothing, food, and out-door exercise, there seems to be nothing that can produce Tuberculosis. This description refers directly to the general population, not to the wealthy few.

Aitkin, in his most philosophical and practical work on practice of medicine, says, in speaking of the consumptive patient:

It is important to secure for the patient a uniform, sheltered temperature and mild climate to live in, with a temperature at 60° Fah., and a range of not more than 10° or 15°, where also the air is dry, and the drinking water pure and not hard.

A very near approximation to these conditions are found in this region, and particularly in the neighborhood of Aiken, S. C., and at Summerville, near Augusta, Georgia.

These blessings are within the reach of every man of moderate means. A few hundred dollars invested in land and a house will enable him to surround himself with every comfort. The price of building material and mechanical labor is such that a cottage can be built, in a plain and comfortable manner, for

a few hundred dollars. Water can be obtained often from springs, and always from wells of the purest kind and most refreshing temperature. For cheapness and certainty, there is no well so calculated to meet this requirement as the Tubular patent used by the British troops in their late march through the deserts of Abyssinia upon Magdalla. The soil is here so light and free of boulders that the tube could be driven down without any difficulty to the required depth, and when once it reaches the water-bearing stratum, a never failing supply of water will appear. Samples of these wells have been exhibited in the city of Augusta, and their operation gave general satisfaction.

There are thousands of acres of land awaiting purchasers, the owners of which are anxious to sell, at very low prices, to actual settlers who come to develop the resources of the country, and sow the fruit-bearing seed, rather than discord between the races. To the former a hearty Southern welcome will be extended; the latter no one desires to see. The great resources of this land have hitherto been very much overlooked, excepting by a few enterprising men, and cotton had taken the place of fruit.

There are many New England and Middle State farmers who are now cultivating a few acres of land in an unfavorable climate for health and longevity to themselves and family. I mean such as are tainted with hereditary consumption, who could sell these lands for thirty times the price it would take to establish themselves on comfortable farms here, which, in a few years, would yield them a handsome income and an abundance of the finest fruits for their own



use. The vine and the fig, the peach, pear, apple, apricot, etc., would soon yield them a superabundance of fruit. Their families would improve in health, for, stimulated by the dry and bracing influence of the climate by reason of their constant out-door employment, winter or summer, they would continually enjoy these hygienic influences.

In this climate his children may romp and play from morning to night in the open air, at all times of the day and in all seasons; for there is scarcely a day, Winter or Summer, Spring or Autumn, when they may not expose themselves with impunity. The ruddy cheeks and sturdy limbs of the little folks attest to the benefit they derive from this habit of living out of doors; and there is no climate in the world, not excepting old England, where the children present a more hardy and healthy appearance.

The character of the soil is such as to require comparatively little labor; for two horses here will do the work of four in the stiff clay lands of other regions.

To the man of fortune, who desires a mild and genial Winter atmosphere, and a safe retreat from the regions of a Northern climate, there is no country within such easy distance as the Sand Hills of these States satisfying these requirements. Here he can erect as cheap or expensive a villa as he may wish, and enjoy all the appliances of wealth and luxury for what a fashionable ball in his own stately mansion at home would cost him; and though his family will not find here the gaiety of the fashionable watering place, yet a delightful social circle would soon be established among themselves, and innocent and

rational pleasures exchanged for the exacting requirements of fashion, and the wearing and enervating dissipations of the ball and the rout. There are hundreds of families of this class who leave every season for climates accessible only by crossing the Atlantic, when they could reach a better climate only two days by rail from the city of New York; and so sudden is the change from the cold of the North to the almost tropical Winter of this region, that it seems almost as marvellous as the fictitious feats performed by Aladdin's wonderful lamp. Once here, the pleasure of physical existence is soon realized in the buoyancy and lightness which seems to accompany each deeply-drawn breath of the exhilarating air.

***A Protracted Residence Necessary to Experience the Full Benefit of the Climate.***

To experience the full benefit of a change of air to this climate, the residence in it should be protracted so long as there is any lurking symptom of latent disease; for, though there are many, no doubt now living, to attest to the benefit of a few Winters' residence, yet they are the exceptions to the rule, or were those who came into it before blood degradation had become established, and important organs structurally impaired.

As a general thing, the first evidence of improvement is a manifest freedom of respiration which the patient almost at once realizes; a return of the natural appetite and improved digestion; sound sleep, undisturbed by much cough; and a desire of being constantly out of doors. I have often heard



the sick say : " Your air is so soothing that I cannot satisfy myself in breathing it." One old gentleman, who had travelled all over Europe and South America, formerly an eminent barrister of New Orleans, said to me :

I long for the air of this climate when away from it as did the hungry Jew in the wilderness for the manna ; and were I a young man (he was then sixty years of age), I would build me a cottage, and plant a vineyard and fig trees, and live upon their fruits, and be almost tempted to return to primitive simplicity of living. The desire for living in the open air is something peculiar to the climate of these hills ; the house seems to be robbing me of a pleasure. I even envy the hours lost in eating and sleeping.

This feeling is not confined to a few, but is experienced by nearly all, and particularly those who are strong enough to walk or ride.

The great mistake which this class of patients make is, that they expect more from the climate than they should, because of this sudden amelioration of uncomfortable symptoms, forgetting that their disease is not only a local one, but a blood defect, which only time and the observance of those hygienic rules found beneficial elsewhere can entirely and permanently remove. They expect, in other words, that the climate will act as promptly in checking their disease as it does in some cases of Asthma, or a dose of Quinia does an exacerbation of chill, or a full dose of opium on incipient catarrh ; forgetting, or not knowing, perhaps, that in blood diseases the cure must be gradual, and that the influence of climate is indirectly upon it through the system, placing it in such a condition as that it may remove

disease by a power inherent to itself, which the doctors call "*Vis Natura Mediatrica*."

If the disease has originated in impaired digestion, the first step toward relief is to place the individual under such conditions as will improve the digestive function, and thus give strength to the system, to enable the patient to take such exercise as will maintain its healthy action. Toward this end the mind should be relieved of those influences calculated to depress it. The patient should avoid the crowded hotel, filled, perhaps, with consumptives, many of them far gone in the disease; the crowded sitting room, with its contaminated atmosphere, breathed by many diseased lungs; for nothing is so essential to healthy and efficient digestion as pure air and a plenty of it, with a cheerful spirit.

The invalid should always be stimulated by the cheering influence of hope, and should never be reminded of the fatal character of his disease, which the crowded hotel of a watering place\* is too sure to do. It is a fortunate thing that this disease is one characterized by great hopefulness, and here kind nature exerts her beneficial sway, counteracting the evil influences calculated to exert a baneful influence upon disease. Thanks to improved means of treatment, and a more comprehensive knowledge of the disease, derived from carefully recorded statistics, we can now remove that dread of an inevitable fate, and say to our patient, you are not necessarily doomed to suffer without relief. There are hundreds of cases which, to the best of our knowledge, have been cured. Though we are not always cognizant of the means, yet we believe that in most cases it has been

---

\*This refers to crowded winter resorts for consumptives.

brought about by an improved nutrition, and a proper attention to those hygienic measures which are in your power to avail yourself of. The most important of these is exercise commensurate with your strength; and to obtain this, you must seek a climate where you will be enabled to take daily out-door exercise; one not too warm or too cold, nor too dry or too humid—if equable, so much the better; but the changes which occur in our Southern climate may be counteracted by proper foresight and precautions, in adapting your clothing to the changes of temperature. Let your feet be always encased in warm stockings and thick water-proof covering, and never lose your daily exercise because the ground is damp. Gentle exercise after eating is better than sitting around a warm fire; and if you keep the body warm by sufficient clothing, and by exercise which does not fatigue, nature will perform her functions, and repair, by healthful digestion, the waste resulting from disease. To experience, however, the full benefit of exercise, the mind should be cheered by the society of a pleasant companion, or such pleasures as will serve to divert it as much as possible from the contemplation of bodily suffering. If you have a fondness for the beauties of nature, so much the better; for you will find her smiling around you at every step you take in the sunny climate of the South. In the beautiful flowers which grow in profusion in its woods and fields, you have an endless source of pleasure, which diverts the mind of weary thought. A friend once said to me, “I believe the study of Botany saved my life. by the exercise I was obliged to take in its study. Often have I wan-

dered, day after day, from breakfast to dinner, in search of one or two rare plants, forgetting self and the fears of a relentless doom, which my reason and the medical opinion of the time led me to believe I could not evade. My friends were anxious, lest I should be fatigued by my long walks; be attacked with a hemorrhage in the woods, or lose the flesh I had gained by too much exercise. So far from any injury, I acquired flesh every day; my strength, too, improved with the return of each bright day, which enabled me to steal away with my box and book; and, though my search was often unavailing, yet I always acquired a good appetite and digestion, and now it has been many years since I have known what a cough is. I find my desire for knowledge to increase each day. In studying the morphology of the vegetable world, I learned to trace causes to effects, and to admire the wisdom of that Being who, by the silent manifestation of His laws, declares, in the language of the poet, that

‘————— each moss,  
Each shell, each crawling insect, holds a rank,  
Important in the plan of Him who framed  
This scale of beings,’ etc.

When I first came to the South years ago, I met young persons like myself, in search of relief from coughs, who hoped to find it in lounging around the boarding-house or hotels, basking in the sunshine of its delightful Autumn or Winter seasons, or perhaps taking short strolls around the town, or short walks in the neighboring pine groves, to return to the hotel and pass the remainder of the morning in lolling in the porch, or resorting to a billiard room, or some kind of amusement indoors. When dinner was an-

nounced, we repaired to the table crowded with those who were so harassed with coughing as not only to interfere with their own enjoyment of the meal, but to prevent others from doing so likewise. I have always thought that a certain amount of pleasure at table was essential to good digestion, and resolved to find private quarters for myself elsewhere. Fortunately, I was enabled to get such through the kindness of a gentleman who offered me a room in his house and a seat at his table. In this family, for he was a married man, I found every attention that I could have desired, and in his society a most charming and delightful companionship. To his many acquirements he added a thorough knowledge of the Botany of the country; and it was through his conversation and teaching that I was induced to continue the study of that science, of which I soon became enamored."

If others, who have both time and the means to pursue some branch of natural history, would only profit by the example of this gentleman, they, too, would find returning health and strength to reward them for their labor in the pursuit of knowledge, which the German philosopher and poet, Lessing, says, if I mistake not, "is pleasanter than its attainment."

To those who are fond of the sports of the field with dog and gun, which Hawker so beautifully describes, the woods and fields of the Sand Hill region offer great inducements. I have known two good shots in the neighborhood of Aiken, S. C., in the month of November, to kill singly on the wing fifty-six partridges (or quail, as they are called North),

beside doves and rabbits to swell the number to seventy head, or thirty-five brace. The manner of hunting this game is peculiar to the South. The sportsman mounts a horse which "stands fire," and rides while his dog courses around in search of game; when he points, the gunner dismounts, ties his horse to some hanging bough, flushes the covey, and pursues it until he has killed as many of the birds as he can find. He is thus enabled to cover a large space of ground in a day's hunt, without any fatigue to himself.

In the Spring, Summer, and early Autumn, the streams of this region, and the mill ponds, of which there are a great many, abound in trout, bream, and perch, which are often taken with the hook and line in large numbers. The trout sometimes attains to a large size, for I have known a celebrated Chancellor, as distinguished for his love of this sport as for his knowledge of law, who captured once, in Croft's pond, near Aiken, one which weighed ten pounds sometime after he had been caught. The bream is also a fine fish, affording the sportsman much pleasure in pulling him from the water, and good eating afterwards. The perch is also a very fine pan fish. Deer and wild turkeys are found in some portion of these hills in the neighborhood of the water courses and thickets bordering on them, and many of these are brought to market by the country people. In certain localities duck shooting is very good.

***A Few Words in Relation to Dietetic and Hygienic Rules which should be Observed by Invalids Coming South.***

There are many invalids who visit the Sand Hill



region of Georgia and South Carolina who are satisfied with a short ride on horseback, or a short stroll around the town, and think they have complied with the demands of their systems and the advice of their physicians in so doing. To such I would offer the following advice: Live in the open air as much as possible, and take such exercise as is compatible with your strength. A little dampness in the atmosphere should never keep you in doors; a day in the house, unless it is actually storming, will do you more harm than any injury you will receive by being in damp weather, providing your body be kept warm while out and dry by proper covering. I know several gentlemen who were supposed, and in fact known, to be consumptive before they entered the army during our recent civil war, and who assured me that their health improved every month that they were exposed to the inclemencies of the Winter in Virginia. It is not the bivouac and march which diseases the soldier, but the barrack and the camp. I knew many men who came into the hospital I had charge of during the war, who confessed that the life of the soldier in the field had benefited them. I kept a record of many of these cases, but had the misfortune to lose it on my homeward journey after the surrender of Richmond, and regret to find no data, referring to the influence of field service upon Tuberculous Phthisis, in the Sanitary Commission Report, published 1867. All authorities, however, both in and out of the profession (for there are many who can speak experimentally on the subject), urge the necessity of avoiding confinement to the house even at the expense of damp clothing; providing



they are only warm while taking exercise. A gentleman, then in the last stage of the disease, once consulted me in Maryland, who stated that two years before he and two others had started for California across the plains on horseback, in company with a train of emigrants, by the advice of their physicians, each of them having had hemorrhage from the lungs, and other unmistakable symptoms of consumption. He said "that the dread of dying away from his friends, and on the bleak plains, so acted upon his fears that his faith failed him, and that, like poor Pliable, he turned back, after being out two weeks. His companions, however, continued on, and are now both well, and carrying on their respective callings in the North. He stated that the exposure seemed to benefit him, and, after the first one or two days, the exercise ceased to fatigue him; and though the occasional showers wet his clothes, it gave him no inconvenience. People," he said, "attribute the great improvement derived from these journeys across the plains to the climate, but I am inclined to think it is living on horseback, in the open air, which a man can do in any good climate." If, with this exercise, the patient indulges in simple but an amply nutritious diet, avoiding artificial stimulation to improve appetite, he will do well. But, above all, he should avoid alcoholic stimulants, excepting a little at each meal, for nothing is so injurious as alcoholic beverages on an empty stomach. I am aware that there is a general impression prevailing, both in and out of the profession, but more particularly out of it, that alcoholic stimulant, in some of its forms, is a most valuable curative means in the treatment

of Tuberculosis. To a very limited extent this is no doubt true, but as a general thing, to be beneficial, the patient must become a martyr to an evil greater in every respect than the disease; for my experience leads me to hold to the opinion that, in the great majority of instances, those who prolong their lives by its use die martyrs to drink, only prolonging by this agent a life whose moral<sup>s</sup> degradation is worse than an early death. These remarks are not intended for those who use it by medical advice in moderation during meals, as an adjunct to the general treatment of deranged digestion, which in some cases cannot be met by any other means, perhaps. The rule for its use should be that observed by the physician when he finds it necessary in diseases attended with debility or prostration, viz: to discontinue its use as soon as he finds it to produce feverish excitement, indicated by flushing of the face and inordinate excitement of the pulse; for these are certain signs that its effect is injurious, and that the consequent depression will certainly be greater than that which preceded its use.

I feel much hesitation in expressing such decided opposition to the use of a remedy of which individuals generally deem themselves the best judges; but having seen great evil resulting from its use, in a medical point of view, I feel constrained to express an opinion derived from an experience by no means limited. If its excessive use was sure to result invariably in a cure, there would be some excuse for holding to it; but since it is not only not a specific, but is positively injurious in many cases, since its inordinate use has been known to cause Phthisis

where it was only suspected to exist, we are authorized to raise a question as to its benefits when the physical and moral evils are so great. Indeed, as an exciting cause of Phthisis, it is one of the most positive, laying the foundation of gastric debility, retarding secretion and excretion, and interfering in every way with that nice balance in the functions of all the organs, which, like the regular movements of a well adjusted machine, is immediately arrested by the breaking of a single pivot. That lassitude, which always supervenes upon the inordinate use of alcoholic beverages, is most deleterious to the consumptive, since he should always bear in mind that he is constantly contending against a powerful foe, and, like a skilful general, he should husband all of his resources for the constant and unremitting battle waged upon him. *Mens sana in corpore sano* should be the motto engraved upon the mind of every man, and to preserve the equable balance of the two requires the constant watchfulness of the intelligence with which we are endowed; and a remedy so calculated to disease the one, though under certain conditions it may improve the other, makes it an agent which the conscientious man should use and recommend with great caution. Such is the responsibility which has presented itself to me when I have thought its use indicated, for so insidious is the vice of drink that it seizes upon some constitutions like a consuming fire—suddenly and quickly; while in others a larger indulgence is necessary before the habit becomes fixed, but once established, is sure to cling with unyielding tenacity to its victim. This vice of constitution, for such it becomes,

is not confined to sex nor age, moral or immoral—all are alike liable to become its slaves, unaware of the danger, perhaps, until the effort is made to abandon it. If the experience of every physician was appealed to, I have no doubt that the truth of the above remarks would be corroborated. As before stated, the objection to its use is not intended to apply to all cases under the advice of the medical attendant, but simply to point out the evils of its general use, under the popular impression that “a little can do no harm,” and that it is invariably beneficial in the treatment of Pulmonary Consumption.

### *Fatty Food Sometimes Deleterious.*

Returning again to the subject of diet: the general impression among consumptives is, that they should indulge in much fatty food. As a general rule, this is, perhaps, true; but in some instances fat, with saccharine food, is converted into butyric acid, which then becomes a poison to the system rather than nutritious, and when this is the case it should be abandoned as soon as the patient discovers any acidity of stomach to occur after eating. Antacids in these cases will avail nothing; the only remedy is to avoid the cause. Carbonate Soda and Alkalis are generally injurious in Phthisis, since they tend to increase the watery condition of the blood. This advice may seem out of place in a work intended only to show the remedial influence of the climate of our region upon Phthisis; but the author feels that often-times the climate is reproached for its inefficiency, when really it is not in fault, and

error in diet, or some bad habit, is constantly counteracting its beneficial and remedial influence. Another reason for volunteering the above suggestion is, that there are many patients who, from various motives, prefer not consulting a resident physician, and thus they remain ignorant of the cause of deranged digestion, forgetting the fact that in a mild climate much fatty food is not as essential to the process of calorification as in a cold one, and, therefore, is not borne so well.

To the wealthy class of invalids who find it necessary to visit the Southern climate every Winter, I would suggest that they obtain their own residences, build, if they can't rent them, comfortable to their ideas of comfort. A Winter villa in this climate may prove far more beneficial to them than a Summer one on the Hudson or the sea shore, and when there is no longer occasion for it, it can be sold or rented without difficulty. Were it known generally at the North that comfortable cottages could be rented for the Winter season in the town of Aiken, S. C., or Summerville, near Augusta, Ga., there are, no doubt, many families who would avail themselves of the opportunity of coming South for the season, who are deterred from doing so by the want of such residences. As a pecuniary investment, it would prove very remunerative, since building is cheap and rents are high.

There is another class of sufferers from the regions of the Northern climate to whom I would address the following remarks—I mean the hard-working mechanic and small tradesman, who, perhaps, has saved a few thousand, or even a few hundred, dollars.



He finds that the cold is very trying to him ; a hacking cough, restless nights, and pains in his chest disturb him. He is induced, perhaps, to ask medical advice. The physician finds unmistakable evidences of Phthisis in his diminished vital capacity, accelerated pulse, gradual emaciation, shortness of breath, and other signs generally indicative of the disease. If he remains in the climate pursuing his avocation, the relentless destroyer will seize upon him irretrievably. He cannot afford to leave his family, abandoning his business, and carrying with him the savings of years of toil in search of that which he may not find, unless he avoids a return to his home and his avocations, and, therefore, he is compelled to stay at home, and trust to remedial means only calculated to postpone his almost certain fate if he remains. To this man, while not too late, the Sand Hill region of Georgia and Carolina offer not only a home at very little cost, but greater chances of recovery from his disease than he can elsewhere find, with far greater comfort than he could possibly enjoy in a colder climate, and an abundance of every fruit and grain, with the assurance that if he should be called from this life he will leave his family a comfortable home and ample means of living the remainder of their lives.

In the preceding pages I have addressed myself to those invalids who are strong enough to avail themselves of the advantages offered by this climate for out-door exercise. When from any cause, but particularly from advanced disease, they are unable to do this, the comforts of home and the consoling society of friends offer them greater advantages,

probably, than they could find here, for a change of climate to such persons, with the attendant fatigue and change of habits and discomforts they may meet with, would be more injurious than any benefit from change of climate, the main advantage being the facility it offers for daily out-door exercise in a dry atmosphere.

In concluding this part of the work, I will again state that a permanent benefit can only be hoped for from a permanent or very protracted residence in this region. The debilitating influence of the climate is more imaginary than real, for the heat, though more protracted, is never as great as in the Middle States at midsummer; and the nights are, in consequence of the dry nature of the air, always very pleasant, and toward morning quite cool. There are many cases of recovery when the residence has been permanent, but only an amelioration when it has been of short duration, too sure to be attended by a return of symptoms as soon as the same exciting causes which first induced the disease again come into play.

For farther information in relation to the climate, see Article Climatology, Part Second.

### *Pulmonary Consumption a Curable Disease.*

The question of the curability of Pulmonary Consumption is no longer one which the enlightened physician of the present day denies. There are still living, however, some old physicians, or were a few years ago, who are so prejudiced by preconceived opinions and obsolete doctrines as to say they have



never cured a case of true Phthisis in their lives, and deny the previous existence of the disease in these cases, which have been supposed by the more modern doctor to be actual recoveries. That they have never relieved a case is not to be wondered at, since the first remedial means they resort to is probably a cough mixture, containing squills, tartar emetic, and opium, to allay irritation with some mucilaginous preparation to lubricate the air passages, applying a large blister to subdue Pleuritic inflammation, enjoin close confinement to the room, if not to the bed, to prevent serious results from exposure with a blistered surface. This was the practice of their day.

Thanks to improved means of research and a clearer knowledge of pathology of the disease, these fatal errors of the past and early part of the present century have nearly passed away with the men who originated them. When we read of the vaunted specifics for consumption published to the world by learned professors and distinguished practitioners, such as Arsenic, Prussic Acid, Iodine, Mercury, Calomel, bleeding, etc., can we be surprised at the influence of St. John Long, the school of inhalers now infesting the land, *et id genus omne*, since they themselves sanctioned quackery under the guise of science? We may now hope, however, that as clearer views of the pathology of the disease have led to a more rational, philosophical, and far more successful treatment, that many more cures will appear, and thus remove this "opprobrium of medicine."

It, therefore behooves every man in the profession of medicine who desires the good of his race, and the advancement of medical science, to add his mite

of knowledge to the accumulating stores of facts, from which it is to be hoped that some great mind like Newton, in physical science, will one day announce the true etiology of disease, a knowledge of which will lead to a more certain treatment of Pulmonary phthisis and kindred diseases, both as to prevention and cure.

Though groping still in the dark, the votaries of medical science are slowly discovering a light here and there, to urge them on in the right path; and thought it is small and as dim even as the organic cell of Schwan, and the spore of Mitchell, Salisbury, and others, yet it is calculated to bring joy and hope to the heart of the aged votary whose path has been beset by false lights and quicksands.

It is a trite saying among the unprofessional that "medicine makes no advance;" that, "while other sciences are revealing the hidden laws of nature, medicine is standing still; and that diseases kill as surely as they have done, or that nature, if left to herself, will more surely conduct the patient through an attack than your boasted science of medicine."

Those who recollect medicine, as it was, may believe this; but those who know it as it is, know the accusation to be unjust, and in no case is its falsity more clearly proven than in the disease under consideration. The statistics of John Hughes Bennett of Edinburgh, the records of the Brompton Hospital, London; and many writers, clearly show numerous cases of recovery under the more rational and philosophical treatment, and each day is adding to the number of recoveries and escapes from this fell destroyer of civilized man; so that we may hope that

the day is not far distant when our knowledge will become so positive as to enable us to restore lost confidence in our art, and persuade mankind to adopt a more rational mode of life, based upon known hygienic laws.

That our present artificial mode of life, with its cares and anxieties, its mental and physical labor, the wear and tear of mind and body incident thereto, are greatly conducive to Phthisis, there can be no question.

The North American Indian, we are informed by Rush, was entirely exempt from this disease until he adopted the habits and vices of the white man (the great exponents of civilization): and though we cannot possibly adopt his habits and customs, yet we may imitate his virtues, and learn a lesson from his habits which may aid us materially in consummating so great an object as the mitigation of a disease which, to a great extent, has grown out of the customs and habits of civilization. The Indian knew nothing of alcoholic stimulants. His food was obtained by the chase, which he followed on foot with the speed of the dog: his lungs were thus duly expanded, and his blood properly aerated. With closed mouth and head erect, he would run for miles in pursuit of the deer, wounded by the shaft his own strong arm had launched. When he sought repose from his fatiguing chase, there were no anxieties or fears of ruin and the contumely of his race to disturb the sleep, which the man of civilization too often seeks in vain upon his downy pillow in his illy-ventilated chamber. There are evils, it may be said, which are incidental to, and inseparable from, society as at present organized; and who can escape from them, unless he is

willing to abandon everything which makes life a blessing? This is certainly a forcible argument, but the query is not unanswerable; for every man has it in his power to resist the evil influences he too often yields a willing assent to, until he is reminded of his thoughtlessness by diseased action in his own system. The first premonitions of decay are unheeded; he goes on from day to day, confining himself to the wearing exertions of business; his stores of wealth are increasing from month to month, but he has not yet enough of wordly goods to satisfy his wants. That word "enough," which has been defined, very truly, to mean "a little more than any man has," is never realized, and thus he pursues the *ignus fatuus* until he finds himself standing alone upon the dark boundaries of another world, where his wealth can avail him nothing. This desire of wealth, this straining every nerve to attain it, is one of the most prolific causes of consumption, the first premonitions of which come in time to ward off the danger, had the advice of science been heeded, in the abandonment of business and retirement for rest and recuperation in a genial climate and less confining avocations.

That Pulmonary Consumption is a disease of the blood, no one with our present light will deny; and herein lies the difficulty of its removal. But yet it is not incurable; and though not amenable to drug medication, yet, by restoring faulty nutrition, we place the system in a condition to aid materially in its own restoration. By what means is this to be attained? We answer, by cutting off, if possible, the causes which brought about the disease. If our houses are badly ventilated, as most of them are in very cold climates, improve them. If our business

confines us in-doors, walk or ride, not drive in a close carriage, to our place of business. Appropriate certain portions of the day to out-door exercise; let our diet be plain, but nutritious, and leisurely eaten. To a healthy man, wine, beer, and brandy, in ever so small a quantity, are injurious to ninety-nine in a hundred, by retarding excretion and secretion. Coffee and tea, though less stimulating, are sufficiently so, and very nutritious and prophylactic against disease. Tobacco destroys the life of any animal when used too freely, and no man who has learned its use can forget the deadly sickness which supervened at first upon its use.

Late hours rob nature of that repose she requires to restore functional activity and organic integrity.

Cares and anxieties, though they are inseparable from our existence, are oftener created by artificial than natural wants.

Incentives to excitement are oftener sought after than avoided.

Lust arrays herself in voluptuous beauty to excite our too willing senses, and we run to, rather than fly from, her fascinating and enervating embraces: and thus, appetite, by indulgence, comes to feed upon itself, until satiety or disease destroys the power of enjoyment. These are all exciting causes of this disease, and terrible aggravators when once developed.

In Europe, and in the large cities of our own country, there are medical men who devote themselves to the study of special diseases, and consequently they become familiar with every phase and form they assume, on account of the great number of

cases presented to their observation, both in private and hospital practice. They thus learn to discern these diseases in their incipieney, and study them from day to day in their progress toward recovery or death. The wide-spread and fatal influence of Pulmonary Consumption has made it a speciality with some of the greatest and most original minds in the medical profession, and through the results of their experience, published in their many works on the subject, do we draw our conclusions as to pathology and treatment.

Unless there be something radically wrong in the constitution of our minds, which leads us to select error rather than truth, we cannot deny the force of their deductions if they be based upon known truths. We are, therefore, constrained to admit the probability of their statements, unless we condemn them in toto, and accuse them of falsifying facts, which would be simply absurd, to say nothing of the injustice of such an accusation. But, when these deductions are sustained by the results of *post mortem* examinations, witnessed by many, and corroborated by the statements of third parties, or perhaps the known history of the case, obtained from distant practitioners, we certainly cannot be accused of credulity in believing their statements, particularly when we daily see under our very eyes corroborating cases. Hence, we believe in the

### *Spontaneous Cure of Phthisis,*

By which is meant a removal of the symptoms and signs of the disease, by some agency unknown to the individual or physician, restoring the lung to



its healthy play. That this oftener occurs is a familiar fact to the student of morbid anatomy, who constantly finds evidence indisputable of the spontaneous cure of Pulmonary Consumption in the cicatrices, found in the lungs surrounded by the phosphatic concretions so common in Phthisis, which, having healed, and leaving a large portion of healthy lung to the patient, who, having died of some other disease, thus yielded testimony as to the curability of this disease. In fact, all organic diseases, in the language of Hues Bennett, "occasionally presented a tendency to spontaneous cure;" who farther says:

He was repeatedly meeting with instances where, although death was occasioned by disease in one organ, there were others which presented traces of previously existing lesions, which in some way had healed. In no organs were such more common than in the lungs, and of no disease was evidence of a spontaneous cure more frequent than of Pulmonary Tuberculosis.

The author endeavors to show, what is now generally acted upon by the intelligent and judicious physician, viz :

That Tuberculose disease will heal of itself, if the faulty nutrition be remedied.

2d. That, with this object, our efforts should be directed to the digestive rather than the respiratory system; and

3d. That the kind of abnormal nutrition which exists is dependent on increased assimilation of the fatty portions of the food.

Hence, he recommends that the general plan of treatment should be to cause the reception of the deficient elements of nutrition, and is, therefore, not tonic or stimulating, but "analeptic or restorative."

Dr. J. Hues Bennett is entitled to the credit of having first acted upon these principles, and of intro-



ducing from Germany the treatment of Phthisis with Cod Liver oil, and of establishing the pathology upon which it is administered.

That this is a disease arising from a vitiated development of cells, there is now, I believe, no question; proven by the researches of Claude Bernard, but more particularly Muller. They state that this vitiated development arises from an abnormal condition of the blastema. It is absolutely necessary that the blastema should contain glycose, albumen, and fat, and the absence of any one of these, in the language of Bernard, "is an inseparable barrier to cell evolution."

This, then, being the accepted pathology of Tubercle, the indications of treatment naturally adopted should be to place the patient under the most favorable condition for the maintenance of all the functions, and more particularly that of the digestive organs and skin, so intimately connected with the respiratory process through its supplementary action. The impairment of this latter function may be caused by several agencies, of which humidity is one of the principal, which fact has been adduced in a previous page.

There are many facts in the history of Pulmonary Consumption which lead us to infer that the first link in the chain of morbid actions is faulty digestion and ultimately defective haematosiis, and lastly, to defective cell evolution, as already shown.

The importance of maintaining the integrity of the digestive function is, therefore, self-evident, and we should, consequently, caution our patients against the use of vaunted specifics, and the thousand and

one cough mixtures, so commonly used even in this day of clear pathological views by those who have never taken the pains to inform themselves of the accepted pathology and treatment of the disease, and who counteract, by these mixtures, the very condition the intelligent physician is endeavoring to bring out, viz: healthy digestion.

Dr. Bennett says, with respect to the curability of Phthisis:

I have conversed with most of the distinguished physicians in this country and on the continent, and find that they are all enabled to refer to cases which they are even satisfied have undergone a permanent recovery, even where cavities have existed in the lungs, and all the advanced symptoms of the disease have been present. Page 51. Ed. 1853: Edinburgh.

And again, page 77:

It follows, from all the information I have been able to collect, that that climate is best which will enable the patient to pass a few hours every day in the open air, without exposure to cold or vicissitudes of temperature on the one hand, or excessive heat on the other. Wherever such a favored locality may be found during the Winter and Spring months, its advantages should be considered as dependent on exercise, and on the stimulus given to the nutritive functions, etc.

Such a climate, we propose to show, exists in the Sand Hill region of South Carolina and Georgia.

In the selection of a residence for the Pulmonary sufferer, we would, before considering the climatic peculiarities of such a region, first and naturally inquire whether Pulmonary Consumption existed to any extent in it among the native population. The fact of this comparative exemption of our region we hope to show—first, by quotations from writers on

the subject; second, by letters from resident physicians of high standing and long residence in the locality; and third, by non-professional, but experimental, sufferers, who, having themselves experienced the benefit, are desirous of giving others the advantage of their experience.

In the September number of *De Bow's Review*, 1866, page 27, in speaking of the Sand Hill climate of South Carolina, but more particularly that of the neighborhood of Aiken, S. C., which differs very little, if at all, from that of the northeastern portion of these Hills in Georgia, this paragraph occurs:

#### FUTURE OF SOUTH CAROLINA.

In regard to the beneficial effects of the climate, your committee can speak from personal knowledge as well as from observation of its effects, as several have been induced to locate here on account of ill health, either of themselves or some member of their family, and most cheerfully do they bear testimony to the good result. Many eminent medical practitioners who are acquainted with this locality, as Dr. Dickson, of Philadelphia, Dr. Geddings, of Charleston, and others, recommend their consumptive patients to try this climate.

And again, page 27, fourth paragraph:

The reputation of Aiken is not based on a few isolated cases, but on the fact that hundreds of invalids, in various stages of their several complaints, have been benefited by a residence here. Not that all have been cured, but that very many have been relieved.

Dr. Amory Coffin, a resident physician of the town of Aiken for twenty years, whose experience in this disease is surpassed by no one, has written a very excellent article on the influence of the climate, published at length by Rev. John Cornish, Rector of St. Thaddeus' Church (Episcopal), Aiken, S. C.,

in a little pamphlet, entitled "A Home for Invalid Clergymen," says :

That this dryness, and consequent purity of air, acts beneficially on persons affected with such diseases of debility as are typified by Tuberculosis, can only be proved experimentally by the cases of thousands who have been materially benefited by a sojourn here.

In an article published in the *Confederate States Medical and Surgical Journal*, Richmond, Va., November, 1864, by Dr. E. S. Gaillard, now of Louisville, Ky., in relation to the climate of Aiken, he thus sums up its distinguishing characteristics, which are :

Its peculiar dryness of atmosphere, its temperate and equable temperature, its freedom from sudden violent atmospheric changes, and absence of frost for two-thirds of the year; its freedom from fogs and malarial diseases, and the general prevalence of soft southern and southeasterly breezes.

Dr. L. A. Dugas, whose reputation as a writer, lecturer, and practitioner, should give great weight to his views, and who has enjoyed an extensive practice in this region for many years, has been kind enough to send me the following letter :

AUGUSTA, GA., January 2, 1869.

*Dr. S. E. Habersham :*

DEAR SIR—In a note recently received from you, I find the following request : "Will you do me the favor to give me the results of your experience and observation as to the influence exerted by this climate upon Tubercular Consumption and kindred diseases?" I will endeavor to make my reply as brief as possible.

Having commenced the practice of my profession in 1831, after spending several years in preparing myself for it in the colder sections of our country, and in Europe, where Tubercular affections and Typhoid Fever constitute a great majority of the cases treated in hos-

pitals, I was very soon forcibly impressed with the rarity of those diseases in this section, in comparison with what I had seen elsewhere. Indeed, some six or seven years elapsed before I saw the first case of genuine Typhoid Fever, when this form of fever first began to show itself here. I need scarcely add that since that time Typhoid Fever has gradually invaded and extended over all the Southern States. Tuberculosis in its various forms, and especially Phthisis Pulmonalis, was scarcely ever seen, except in those who fled from the North in order to escape it, and among the negroes imported from Maryland and Virginia, where they had inherited the tendency. Such a radical change in the field of my observation could not fail to attract my attention, and to impress me as before stated.

In 1836, I had occasion to examine the mortuary records of the city sexton as far back as they could be found, for the purpose of preparing an article on the subject for the *Southern Medical and Surgical Journal*, published in this city. The result of this, as well as of subsequent researches, furnishes a striking confirmation of the correctness of my impressions.

It seems to me that the best test of the influence of climate upon the development of Tuberculosis must be found in the relative frequency of such cases among the natives of this and of other sections who remain at home. Judged by this standard, it will be readily ascertained that, while Phthisis Pulmonalis is very common in our Northern States among the natives, it is quite rare here among our own people. I know of very few native families in Augusta who have ever suffered from consumption, and these have only lost one or two members by it. I doubt that there are exceeding ten families who have been thus even partially affected within my recollection.

Again, if we confine our observation alone to those who have emigrated from the north of the United States and from Europe, it will be found that, although many bear with them the hereditary taint, comparatively few will experience its fatal development. The conclusion is, therefore, irresistibly forced upon us that



this climate does exert a most beneficial influence over this class of affections.

Is there any difference in the several sections of Georgia with regard to this comparative immunity from Phthisis? There is a marked difference. I find that in 1852 I made the following remarks in an editorial article of the journal above alluded to (p. 636):

“The value of a removal to the South, of persons affected in the Northern States with consumption, has been heretofore very generally admitted; but it is now asked whether much, if any, advantage is to be derived from spending merely the Winter months at the South, and returning to the North in the Spring; and it is added that if a temperate atmosphere be all that is needed, this may be obtained in New England by means of a well regulated system of artificial heat. We believe it to be an error to suppose that the Southern States owe their immunity from Phthisis alone to the mildness of their Winters. If such were the fact, all mild climates ought to be equally exempt, and all cold latitudes alike unfavorable. Yet, Phthisis is much more common upon the seaboard, and in the mountainous districts of the Southern States, than at intermediate points, and it is comparatively rare in the northern portions of Canada and Russia; whilst it makes frightful havoc in milder England, France, and our Northern States.

“That a temporary sojourn in the Southern States is advantageous, we doubt not; but that a permanent residence is still more so, we feel quite certain. Every practitioner of experience, and who is acquainted with the means of accurately determining the state of the lungs, must have often observed how wonderfully large abscesses will heal here, which would have certainly proved fatal in a less genial climate. The writer knows persons in this State who had tubercular abscesses as long as twenty years ago, which healed kindly, and have left them ever since in the enjoyment of apparently good health. That all are not equally fortunate, is too true; yet, we feel assured that it is only by remaining in the South, both Summer and Winter, sufficiently long to acquire the peculiarities of a Southern constitution, that lasting benefit may be expected. The

best locations are obviously those in which the disease *originates* most rarely, and these are unquestionably to be found midway between the mountains and seaboard."

This favored belt commences at the termination of the primitive region, where the rivers of the Atlantic slope tumble over the last ledges of granite rocks—that is to say, at Augusta, Milledgeville, Macon, and Columbus, and varies from thirty to sixty miles in width below the shoals.

The so-called Sand Hills, with pine forests, which characterize this belt, are only a few hundred feet above the sea; are supplied with pure water, and have a healthy atmosphere, peculiarly adapted to those threatened with or suffering from Pulmonary disease. I must say, however, that some cases do better in the valley of Augusta than upon the adjacent heights, and *vice versa*. Why this is so I cannot determine.

Yours, very truly,

L. A. DUGAS.



## PART SECOND.

*Climatology.*

The following sketch of the climatology of this region has been prepared with much care and research, from such reliable data as could be made available, and particularly that of the Meteorological Register, kept at the U. S. Arsenal, near Augusta, Ga., by the officers of the Medical Staff at that post. This register contains a series of uninterrupted daily thermometrical observations, made at sunrise, 9 o'clock a. m., 3 o'clock p. m., and 9 o'clock p. m., for twenty years, including three of the severest Winters and hottest Summers within the memory of the oldest inhabitants; and being made at about the centre of the Sand Hill region, gives, without doubt, the most reliable information to be obtained from any source.

This Post occupies the most elevated point along the whole line of these Hills, save that of the plateau upon which stands the town of Aiken, in South Carolina, and offers, perhaps, the most eligible position for observing the currents of air so easily diverted from their general direction by irregularities of surface.

The summary of these observations show the mean average temperature of the year to be 64°

Fah.; and the mean monthly temperature to be, for the month of January,  $46^{\circ}-7$ ; February,  $50^{\circ}-7$ ; March,  $58^{\circ}-8$ ; April,  $65^{\circ}-1$ ; May,  $72^{\circ}-2$ ; June,  $79^{\circ}$ ; July,  $80^{\circ}-9$ ; August,  $79^{\circ}-7$ ; September,  $72^{\circ}-8$ ; October,  $63^{\circ}-5$ ; November,  $53^{\circ}-8$ ; December,  $46^{\circ}-3$  Fah.; and the mean temperature for the four seasons to be, for the Spring,  $65^{\circ}-3$ ; Summer,  $79^{\circ}-9$ ; Autumn,  $63^{\circ}-4$ ; Winter,  $47^{\circ}-9$  Fah.

### *Precipitation of Rain.*

From the same data, we estimate the mean annual to be 37.17 inches, and the mean monthly for January, 1.80 inches; February, 1.92 inch.; March, 3.79 inch.; April, 2.46 inch.; May, 4.42 inch.; June, 3.91 inch.; July, 4.62 inch.; August, 5.61 inch.; September, 2.10 inch.; October, 3.23 inch.; November, 1.16 inch.; December, 2.21 inch.

For the four seasons, viz: Spring, 10.16 inches; Summer, 14.14 inches; Autumn, 6.95 inches; Winter, 5.92 inches.

Mean number of fair days per year, 238; cloudy days, 127; rainy days, 70; snow about two days in three years.

General direction of the winds for the four seasons: Spring, northwest and southwest; Summer, south and southwest, varying to south; Autumn, north, northwest, and southwest; Winter, south, southwest, west, northwest, and north.

If we compare the above thermal data with Isothermal lines, as projected by Humboldt, we find that it places our Winter on the Isothermal of Spain, South of France, and Northern Italy; while our

Summer corresponds to that of the South of Spain and Italy, Sicily, and South Greece. This is also proven by the similarity in the vegetable productions of these regions.

In estimating the value of any climate in relation to its influence upon Pulmonary Consumption, its prevailing winds have a very important bearing, since they not only modify temperature, but also the hygrometrical condition of the atmosphere, the dampness of easterly winds, and the warmth in Winter of a southerly wind, is proverbial on the eastern coast and slopes of North America. According to the received opinion among American Meteorologists, the southern and southwesterly winds in our Summer seasons are the great hydraulic powers which supply the whole eastern portion of our continent with the humidity, which, acted upon by the prevailing ærial current from the West, said to blow uninterruptedly across the continent, produces the various hygrometrical conditions of the climate.

The Summer showers of this region generally come from the Northwest and West, being produced in part by the condensation of the surface vapor acted upon by the above-mentioned westerly current, which, having parted with much of its heat in crossing the Rocky Mountains, is ever in a condition to condense the warmer vapor of our region into storm clouds, which pour upon our vegetation their refreshing and life - sustaining showers. These showers are generally attended with loud detonations of thunder, and other electrical phenomena, and generally follow several days of greater than usual warmth of the atmosphere.

The heat of our Summer temperature is very much exaggerated by strangers from more northern latitudes, who fly at the first approach of the warm weather of Spring; but those who remain among us often express much surprise at the mildness of the climate in this respect, since, though more protracted, the thermometer never shows at midsummer as high a range as in more northern regions of the temperate zone of this continent.

During the warm season, as soon as the sun acts with sufficient force to set in motion the surface atmosphere, a southerly breeze springs up, and continues until a few hours after sunset, when the equilibrium of the atmosphere and terrestrial temperature is established by radiation. Thus does the cool breeze in the day, which often obtains a velocity of ten or twelve miles an hour, and the radiation at night preserve a most pleasant and agreeable temperature; as an evidence of which, sun strokes, so common at the North, never occur here, and often at night a blanket is found quite conducive to comfort. Beside this prevalence of a pleasant Summer temperature, we generally have a season of cool, cloudy, and damp weather about the middle of August, which lowers very much the average temperature of the season.

The modifying influence of forests upon temperature and humidity is acknowledged to be very great since, independent of the influence of foliage in shading the soil from the direct rays of the sun, its color absorbs much of the white rays of the sun; while, at the same time, it affords humidity to the atmosphere by the evaporation which goes on from

the surface of the leaves; and thus they serve the double purpose of modifiers of temperature by the protection they afford, and the evaporating surface they present. This hygrometic influence is particularly manifest where the pine predominates over every other growth, the leaves of which, from their peculiar conformation, are not so well adapted to this hygrometic function as are the broader leaved oaks, etc.; and to this character of forest may we partially attribute the dryness of the Sand Hill climate.

The character of the soil contributes materially to this condition, since it has been shown by the experiments of Scheibler that loose sand absorbs from 60 to 96 per cent. of water; and, as it is thus removed from the surface, evaporation is much reduced. This is particularly the case with our sandy soil, which, coupled with the open nature of the pine forest, the great elevation of its foliage above the surface of the land, enables us to appreciate the influence of this drying power of the sun upon a soil so exposed to its action. In consequence of this atmospheric dryness, resulting from these various causes, the dew point is very low, and consequently, heavy dews are never known, and fogs are rarely seen. Another effect of atmospheric dryness is increased radiation, so that the nights of this region are generally cool and bracing, as before stated, even when the days are warmest, and thus the system is braced up by refreshing sleep.

If we compare the preceding climatic conditions with those of other places, particularly the localities recommended by the European physicians in the

South of France and Spain, we find a remarkable similitude in many respects. Let us take Pau, for instance, which is within forty-eight hours' ride of London, and which is very popular among the English and many of our own people, where the season commences in the beginning of November and continues until the end of May, with only a few degrees difference in the mean yearly temperature, and those of the four seasons. The average rain precipitation is rather in our favor, while the rainy days are greatly in excess of ours, corresponding to our cloudy days. In soil there is a very near resemblance with respect to its absorbing power of water. Sir J. Clark thus describes the characteristics of this place :

Calmness, moderate cold, bright sunshine of considerable power, a dry state of the atmosphere and soil, and rains of short duration.

A more accurate description of our climate could not be written ; but he goes on to say :

Against these must be placed changeableness, the fine weather being as short-lived as the bad ; rapid variations of temperature within moderate limits. In Summer and Spring there are heavy rains. The air in December, January, and February is dry, and out of the sun cold ; but even in these months the rays of the latter are so powerful that the pedestrian ought to protect his head with an umbrella. There are a very few days on which the invalid will be unable to take exercise between 12 and 3 o'clock.

The changeableness of our climate, like that of Pau, is within moderate limits ; but our fine weather in Spring and Winter is not short-lived, and there is very rarely a day through the whole Winter, from November to April, when a patient may not exer-



cise in the open air, never requiring an umbrella against the rays of the sun. Our North and West winds, which are cold winds, as all Americans know, are not generally over ten or twelve miles an hour, excepting in the month of March, and occasionally in February, when they are unpleasantly free, in open places; but against these winds the forests afford shelter, and once in the wood, they cease to be disagreeable. If we compare the last two places with the data before us, the advantage is decidedly in favor of the Sand Hill region of Georgia and South Carolina, since it has been shown in a previous portion of this work that this climate is exempt from any deleterious influence upon the health of its inhabitants during two-thirds of the year. When there is much debility, with profuse expectoration, accompanied by large cavities, it is probable that the climate of Summer may prove injurious to a Northern constitution, though this is by no means an established fact.

In using the term dryness, with respect to our climate, we mean it only in a relative sense, as compared to that of the sea coast and mountain region, since the wet and dry bulb thermometers seldom indicate a greater difference, even in a long spell of dry weather in Summer, than  $18^{\circ}$  or  $20^{\circ}$  Fah. Salt never deliquesces, leather seldom moulds, and surgical instruments rarely rust from humidity in the atmosphere. The long gray moss (*Tillandsia Usneoides*), which grows only where there is humidity, cannot be grown here; and the Fungi of moderately damp localities are never found, save on the large streams, or in the immediate neighborhood of

swamps. The rain chart of the Army Meteorological Register shows this region to be within the area of moderate rains, and the favorable seasons for cotton and maize crops clearly prove the climate exempt from those long protracted seasons of rain and storms which injure it in other regions.

In the preparation of the preceding sketch, I have found it impossible to procure barometrical data of sufficient value to warrant its insertion, which necessarily renders this summary imperfect. I trust, however, that its usefulness will not be much impaired by this omission, and that the physician, as well as the agriculturist, will find in it sufficient and reliable information for their respective uses.

### *Physical Geography.*

A perfect description of the surface of any region of country can only be given from a thorough knowledge of its topography, acquired from actual surveys and drawings of the same. Did we have access to such drawings, it would be incompatible with the scope and interest of our work to enter such minutiae, since our only object is to present, in as succinct and clear manner as possible, the general characteristics of the topography of the Sand Hill region in the two States, which will be seen to embrace an extensive area.

Commencing at the falls in the Savannah river, five miles above the city of Augusta, where the Sand Hills proper commence in this State (Georgia), and following a line corresponding to the present ocean boundary, we have an arc of a circle, the chord of which extends in a northeasterly and southwesterly

direction. This chord marks the general direction which the Sand Hills take in this State (Georgia), viz: southwest and northeast, with an average width of thirty miles, more or less; bounded on the northwest by the red clay hills of the primitive geological region, and on the southeast by the tertiary region, covered with the long leaved pine (*Pinus Australus*).

Taking the Savannah river at Augusta as our point of departure, and following the arc above described for perhaps fifty miles, we reach the great Ogeechee river. The country lying between these two rivers, on this line, is elevated some four or five hundred feet above the sea level, and is broken into many ridges and hills, through which the rivers and creeks, which take their rise in the primitive geological region, flow, to unite with their respective rivers flowing from the Piedmont region; while many smaller streams and rivulets which spring from the base of these hills and elevations, show themselves in the long ravines which separate the ridges. This description of the land lying between the Savannah and Ogeechee rivers corresponds with that between the Ogeechee and Oconee, Oconee and Ocmulgee, and the latter and Flint river.

Dr. Joseph Jones, in his topographical description of the country around Americus, in Sumter county, Georgia, published in the Medical Report of the U. S. Sanitary Commission, 1867, thus describes the Sand Hills of that part of the State:

Andersonville (near Americus), with the surrounding hills, including the Confederate military prison, is elevated from three hundred and fifty to four hundred and thirty-five feet above the level of the ocean, and is situated in Sumter county, Georgia, between the Flint

and Chattahoochee rivers, seven miles due west of the former, and forty-two miles east of the latter, in about  $32^{\circ} 10'$  north latitude, and  $38^{\circ} 26'$  west longitude, near the commencement of the western slope of the dividing ridge, between the streams flowing southwesterly in the Gulf of Mexico, and those flowing southeasterly into the Atlantic Ocean.

Fort Valley, twenty miles northeast of Andersonville, at an elevation of five hundred and thirty feet, lies upon the west of the ridge running between the Ocmulgee and Flint rivers; the former uniting with the Oconee, and forming the Altamaha, empties into the Atlantic Ocean, and the latter, uniting with the Chattahoochee and forming the Apalachicola river, pours its waters into the Gulf of Mexico. From this dividing ridge the country slopes towards the Atlantic on the southeast, and towards the Gulf of Mexico on the southwest.

The summit of the hill at Andersonville, upon which the Confederate States General Hospital has been located, is four hundred and thirty-five feet above the level of the sea, and, according to the railroad survey, is next to the highest point on the railroad between Oglethorpe and Albany—the highest point between them being about four hundred and eighty and six-tenths feet. High table land, with an average elevation of about four hundred and sixty feet, lies between Andersonville and Americus, the highest being four hundred and eighty and six-tenths feet.

The following are the elevations above the level of the sea at several points above Andersonville: Railroad depot, three hundred and ninety-nine feet; hill opposite depot, four hundred and eighty feet, etc. The hills of this rolling country in and around Andersonville vary in height from forty to one hundred and eighty feet above the level of the water courses.

This region, as above described by Dr. Jones, terminates the Sand Hill region in Georgia on its western boundary.

Returning again to our point of departure on the Savannah river, and taking a northeasterly direction,

we pass over the same character of hills and ridges through which the Saluda, Wateree, Great Pedee, and minor rivers flow, and, like the rivers in Georgia, form rapids in their course upon rocky beds of chlorite slate, gneiss, etc.

We thus see that this line of hills passes through South Carolina, in a northeasterly direction, about one hundred miles from the sea, and nearly half way between the ocean and Blue Ridge mountains, possessing all the characteristics of the Georgia ridge, so accurately described in Dr. Jones' report of its southwestern terminus.

The direction of the slope from this elevated region towards the Atlantic is in a southeasterly direction, with a fall of about two feet to the mile from the base of the ridge, which, but for the tortuous course of the streams flowing to the ocean, would give too rapid a current for profitable steamboat navigation.

The large rivers which take their rise in the Blue Ridge mountains and Piedmont region are, in the Winter and Spring seasons, very turbid with the washings from the red clay hills of the primitive geological region. This is also the case with the smaller streams which originate in the red clay region, but the water of the smaller, springing from the Sand Hills, is clear, and in Winter affords excellent drinking water. These smaller or spring streams fall rapidly from their sources, so that some of them, not more than ten or twelve miles long, have as many as eight or ten saw and grist mills upon them. In some portions of their course, flats of variable width occur, in which the lands are naturally quite produc-

tive; while in the valleys of the largest rivers, which are very extensive, large crops of cotton and maize are made. In the Spring, Winter, and Autumn months, these valleys are occasionally overflowed from mountain rains, when a rich deposit of surface soil is left, increasing very materially the productiveness of the land.

The maximum height of this elevated ridge is supposed to be reached at the United States Arsenal, near Augusta, Georgia, and estimated to be, by survey, three hundred and fifty feet above the low water mark of the Savannah river at Augusta, and three hundred and twenty-seven feet above the plane upon which the city stands, or about six hundred feet above the sea level. From this summit the land slopes, gradually at first, for about one mile, and more rapidly for six hundred yards, until it reaches the plane. Upon the eastern slope of the Sand Hills stands the town of Summerville. The valley at the base of this ridge extends along the banks of the Savannah river, which makes a semi-circular bend at this point about ten miles, more or less, as far as Butler's creek on the south, with an average width of about two miles and a half.

Returning again to the Arsenal, we find the land gradually sloping in a westerly direction until it reaches the red clay lands, with which it gradually blends some eight or ten miles distant. Rae's creek, which washes the base of the Summerville ridge, seems to separate the sandy from the clay formation, is, by actual measurement, three hundred feet below the summit, one mile and a quarter in a northerly direction.



From the Savannah river at Hamburg, the hills rise precipitately for about two hundred and ten feet; then gradually, until they reach their maximum of six hundred feet at the Aiken plateau, South Carolina, distant sixteen miles by rail from Augusta, and from thence, in a northeasterly direction, they very gradually lose elevation, according to the best information I can get on the subject.

This whole region, extending from the eastern boundary of South Carolina to the western limits of Georgia, is watered locally by spring streams of the purest water, becoming large enough for milling purposes; by creeks running over rocky beds, and by rivers with sufficient force to manufacture ten times the cotton made in the South.

The following sketch of the physical geography of the Sand Hill region in South Carolina and its boundaries has been kindly furnished me by the distinguished Professor, John Le Conte, of the University of that State :

The upper limits of the Sand Hills proper, in this State, are tolerably well defined. They occur, generally, at or near the boundary between the granite region of the up-country and tertiary formation of the low country. Along the rivers this boundary is indicated by the occurrence of the *lower falls*, which form the head of steamboat navigation in the streams. The lower termination of the primitive formation determines this boundary. It is not always well defined, but is usually sufficiently well characterized along the streams. Thus we find the true Sand Hills near Hamburg (as at Aiken), near Columbia, Camden, Cheraw, and also at Fayetteville, North Carolina. They are usually found adjacent to the rivers, and are better developed near the larger streams than the smaller ones. There are many indications that these accumulations of sand were produced by aqueous agency

during the period when the lower boundary of the primitive region constituted an ancient *sea beach*. The "high hills of Santee" seem to be true "Sand Hills," although not occurring precisely at the boundary above indicated. They probably constitute ancient *sand banks* not very remote from the sea shore.

The boundary of the Sand Hill region, which has been indicated above, constitute its upper or western limit; its lower or eastern boundary cannot be defined with any degree of precision. In fact, those ridges of sand just out towards the coast, especially near the larger streams, over various portions of the tertiary region, in a manner not unlike the irregular distribution of sand banks in the ocean, near the shore line. This renders it almost impossible to define where the ancient and more lofty Sand Hills terminate, and where the more recent Sand Hills lower down begin. Hence, it is impossible, in the existing state of our knowledge of the geology of this region, to assign an average breadth to the Sand Hill region of this State.

Mills, in his "Statistics of South Carolina," page 131, estimates its width to be thirty miles, more or less, and its height above the ocean to vary from one hundred and fifty to three hundred feet.

Columbia, height above tide water . . . .	233 feet (depot)
Columbia, height above tide water . . . .	300 feet (city)
Camden, height above tide water . . . .	100 feet (depot)
Cheraw, height above tide water . . . .	144 feet

As the Geological formation of the country along the line described varies very little, if at all, in its general characteristics either in Georgia or Carolina, and being indicated by the falls terminating at the head of navigation on the rivers draining the great southeast water shed of the two States, we may conclude that the surface characteristics correspond. In some localities the clay appears without any surface-covering of sand, from which it has evidently been

washed by rains since the formation of the hills, while in other places it lies many feet below the surface.

### *Geology.*

The following sketch of the Geology of the Sand Hill region has been kindly furnished me by Mr. William Phillips, Architect and Civil Engineer, of Augusta, whose knowledge of the science is much more general than his diffidence permits him to acknowledge, and whose careful study of the characteristics of this section, during his many surveys and his connection with the Augusta Canal and Water Works for many years (he having been their constructor), enable him to write with much accuracy on the subject.

The Geology of this region, is only casually alluded to in the works I have been able to find on the subject, which makes Mr. Phillips' sketch the more valuable, since, I believe, it is the first one written. The primitive and tertiary region having been the most important and interesting sections, have received more attention in all Geological surveys hitherto made in both of these States, and being only a tyro in the study myself, I have been constrained to use the knowledge of others in elucidation of that important branch of science—important not only to the miner and manufacturer, but also to the agriculturist.

AUGUSTA, GA., January 1, 1869.

DEAR SIR.—I regret that I am so engaged at present as not to be able to offer you anything more than a mere sketch of the Geology of Richmond county, which I hope may be of service to you, as it may be taken, with

slight modification, as the Geology of a line extended from the Chesapeake to the Gulf of Mexico.

As you are aware, this county happens to be at the termination of the secondary lap on the primitive formation, that is to say from Augusta upward in a southwestern direction, the geological formation is primitive, and in the southeastern direction, secondary, tertiary, etc.

Beginning at the head of the Augusta canal, which is about a mile above Richmond county, and following it or the river to which it is nearly parallel, we traverse the lines of stratification, which are about northeast, at a right angle, and thus have an opportunity of determining very easily the geological changes. The river seems to have cut through and formed its bed, in the various strata traversed by it, at a depth varying from seventy-five on the banks to some two hundred or more feet on the hills adjacent. From the lock of the canal to the upper end of Augusta, the bed of the river is a series of falls and rapids. In a distance of about five miles the fall is about sixty feet.

At the lock the formation is gneiss, which is there penetrated by a vein of granite. Above the lock the granite in several places seems to have passed through the gneiss. Its protrusion is seen in several places on the river; at Stalling's island a large bed was found, from which the material was obtained for the Granite mills in the city and for other works on the canal. In this granite, epidote and pyrites are found.

Passing down the canal we find the gneiss formation stops just below the mouth of Red's creek, about a mile below the lock. Here we find a thin stratum of mica slate, and just below it a black silicious rock resembling a silicious manganese incorporated with apparently fused gneiss. From this point to Augusta the formation may be considered that of chlorite slate, though it varies considerably. In the first place, for about a quarter of a mile, the rock is felspathic, then comes a bed of talcose slate, and after it the chloritic rocks, which extend to Augusta. These chloritic rocks vary very much in character, and in some places the epidote is so predominant as to have acquired for them the designation of epidotic gneiss. At Augusta this formation

disappears, being covered by a heavy and deep diluvial and alluvial deposit. The general direction of stratification is about northeast, the dip to the southeast is, at the lock, from forty to forty-five degrees, but at Harrisburg nearly level; at Hawks' gully the dip is to the southwest; at McKinne street, in the city, nearly vertical. This brief sketch can not convey to you a tithe of the interest with which they could be studied. At and above the lock we find the granite, supposed to be the original rock, passing into and through the gneiss. At Red's creek there are evident signs of subterranean action, for there we find the gneiss changed, and though in layers, has thousands of vertical and other seams in it, and a part of it seems to have been fused or melted with a mixture of manganese, etc., forming a hard black rock resembling lydian stone. At McAlphin's bridge the veins of quartz seem to have passed through it into the red clay with which it is there overlaid. At Rocky creek there are numerous cubic crystals of sulphurate of iron, some of them hepatic by exposure, two inches in diameter. At Rae's creek, in the chlorite slate, there are millions of small crystals of sulphuret of iron, and in one quarry worked there, a small deposit of arragonite and carbonate of lime was found.

The color of the gneiss from the lock to Red's creek is pretty uniform, but then it becomes lighter gray, and the fissures in it are frequently lined with the metallic arborescence recurring at the lock. The colors of the chloritic slate formation vary from a bluish green to a yellowish gray, according to the prevailing presence of epidote or chlorate or their entire absence. Just above Warren's spring there is a bed of rock mainly felspathic, which sharpens readily the hardest steel, and of which I presume excellent hones could be made. In other places the strata or beds are of the peach blossom color, indicating to my mind the presence of chrome. Generally these last mentioned rocks are soft; but on the south side of Rae's creek (keeping the line up the canal) they seem to have been indulated, and are very hard, and here, too, in this bed we find the aborescent lining of the fissures nearly the same as at Red's creek.

This primitive formation, as it is called, is covered in

the first place by an equally primitive bed of drift, and by apparently more recent beds of clay. The alluvial covering only occurs on the margin of the river. The primitive drift, as I would designate it, is composed of firm white sand, gravel and clay, the color being a most distinctive characteristic. In some places it forms a solid rock, as at the Cumming quarry, formerly worked by Glendenning, but in others the sand and gravel are loose and the clay in beds. The solid rock at the Cumming quarry, and other places, though made up of quartz, mica, and felspar, and often called granite, is really a sand stone, the quartz in it rounded or water worn grains, the mica finely comminuted, and the felspar in a state of indurated clay; this last holds the other materials together, and makes it a stone hard enough to be used, as it was formerly, for building purposes. In this rock I have not found any organic remains, and have noticed only such other minerals, such as garnet, etc., common to the primary rocks; hence I take it to be the very first formation, by mechanical means, after the primitive. The clay of this formation is usually white, or rather gray, sometimes plastic, but not generally so until it is well worked—the porcelain clay of Kaolin, in South Carolina and other places in the neighborhood belongs to this formation; it seems to be made up of the unindurated or decomposed felspar, washed from the primitive granite and gneiss of the up country. Here it lies upon the drift, and in excavating for the canal, and for other purposes, it was seen that the red clay rested upon it. This formation, perhaps, corresponds with what is called the Potsdam sand stone of the State of New York.

Over this drift there is what I would call a diluvial formation, consisting mainly of red clay, sand and gravel. In some instances this deposit rests upon the primitive, and without careful observation would be considered the secondary. In the cuts for the canal, and other works, however, it was found to overlay the more primitive of these formations. At the Sand Hills west of Augusta, and at other places, the sand under the clay is indurated, and forms what may be called ferruginous sand stone, the sand seeming to be cemented together by the decomposition of iron pyrites, or an



oxide of iron. Sometimes the black oxide of manganese is present to such an extent as to make it perfectly black, and perhaps a workable ore of manganese.

Underlying these beds of clay and sand, vegetable organic remains have been found. In excavating the third level of the canal at Marbury street in Augusta, specimens of wood were found, which, in some respects might be considered as lignite, while in others they seemed rather to approach silification or, as usually expressed, petrification. Here it was difficult to determine to which of these formations these remains properly belong; the testimony, however, slight as it was, led me to the conclusion they were of the diluvial. In many places this diluvial, as I call it, is in immediate contact with the primitive rocks, as if they had never been covered by the older formation, or it had been removed by some more recent action, perhaps the flood of the diluvial.

If we go back now to the lock, and begin there our examination of the alluvial, we find a small area of five or six acres between the canal and the river, extending from the lock to Red's creek, where the foot of the adjacent hill comes out to the river. Between Red's and Rocky creek this formation occurs again to the extent of about one hundred and fifty acres. From Rocky creek to a short distance below Warren's spring, the river bank is of rock, and there is no alluvial on them, but at the place last mentioned this formation begins again, extending across Rae's creek, and sweeping to the southeast forms the plain of Augusta, which, with some slight interruptions extends to McBean creek, which is the county line on that side. On the Carolina side of the river the banks are rocky and high, and there is but little of the alluvial formation on that side from the lock to a short distance below the mouth of Rae's creek. Here the formation begins, and spreading out toward the north, forms the plain of Hamburg, which extends nearly to the Sand Bar ferry. On this side of the river this plain varies in width, and extends from the river to the foot of the Sand Hills, which, at the distance of about a mile, are some two or three hundred feet above it. On the Georgia side the termination of the alluvial plain is not so well marked, as it

joins the valleys of Cupboard, Rocky, and Butler's creeks. The high ground or hills, such as Turpin's, Golden Camp, Gen. Watkin's, and others, are consequently a considerable distance from the river. This alluvial plain of Augusta contains several thousand acres, a large portion of which is in now neglected cypress swamps. They could be drained, and I have no doubt will be in time, thus making an important addition to the richest arable land in the country.

The Savannah river, from the lock to the city of Augusta, has its bed in, and traverses the primitive rocks already mentioned, in width it varies from eight hundred to thirteen hundred feet. From the lock to the city it has a fall of fifty to sixty feet, and passing over these rocks its bed is a series of small falls and rapids, its ledges are generally occupied by fish dams and traps, and it is only navigable for small boats carrying forty to sixty bales of cotton. This part of it, however, is not now used for navigation, all the trade being diverted from it by the canal—practically, therefore, it is only an immense shad trap. From the city, downward, say to Savannah, it is usually navigable for boats carrying from two to five hundred bales of cotton. In a dry season it sometimes gets very low, and lighters have to be used. In ordinary seasons it is usually within its banks; but after extraordinary rain floods it sometimes rises to thirty-eight or forty feet above low water mark at the city, and the city, as well as all this alluvial plain, is overflowed. Such floods, however, do not often occur, and when they do, if at the proper season, the swamp planters congratulate themselves on an accession of four to eight inches of silt, which adds materially to the fertility of their lands.

The creeks—Red's, Rocky, Rac's, Cupboard, and Butler's, as well as Spirit creek, and McBean also, traverse these primitive creeks, and no doubt take their direction from the irregularities of their surface; they are supplied by innumerable springs of the purest water, filtered through the diluvial. The margins of these streams are made up of the washings from the adjacent hill sides, and the swamp growth of vegetation so common to them. In some places the mass of matter thus made up is extensive, and presents nearly all the characteristics of peat,

At McBean we find the myrtle and magnolia of the sea coast—are they to be considered only as the remains of that ancient coast, or as indicative of a submarine formation at that place?

The sketch I have given you is entirely local. The very slight opportunity I have had for generalizing, induces me to believe it is a description of a belt extending from New York city, crossing Chesapeake Bay near the Potomac, passing through Virginia, North and South Carolina, and turning through Georgia and Alabama up to the valley of the Mississippi. From Cape Hatteras, southward, it is about equidistant between the present seacoast and the range of the Blue Ridge Mountains.

Having avoided all speculation, I need not apologise to you for the absence of the scientific geological terms so prevalent at present. In fact I have not studied Geology as a science, and have only availed myself of its teaching as required by a Civil Engineer.

Respectfully, your obedient servant,

WILLIAM PHILLIPS.

### *Botany.*

In describing the Flora of this country or region, neither space nor the requirements of this work permit me to give a specific description of each plant, nor is it important that a full list of all the indigenous growth should be introduced, since such information can be easily obtained from Elliott's and Chapman's works on Southern Botany. I shall, therefore, confine myself to a list of a few of the more important trees used for mechanical purposes and fuel, and those flowers which, in their wild state, are the most beautiful, and best adapted to the requirements of the florist. None of the resources of our favored region have been more neglected than the beautiful wild flowers of our forest, which

seemed "born to blush unseen," or at least unnoticed by the florists of our country.

The Flora of our Sand Hill region is mostly similar to that of the country below and toward the seaboard; especially to that of the light and sandy pine lands of the lower country. There are certain plants, however, which, without being peculiar to this region, may be said to characterize and give to it distinctive features, from their abundance and general distribution over the area. Of these, the long leaved pine, before mentioned, and the scrub oaks; the small huckleberry (*Vaccinium dumosum*); the peculiar *Baptisia perfoliata*; the very handsome and showy heath-like evergreen (*Ceratiola ericoides*); and many others which delight in sandy soils. Along the creeks and water courses we find a vegetation not dissimilar to that of like soils in the surrounding country.

Among the larger trees used, either for building material or fuel, or as ornamental for their foliage, may be mentioned the following as most conspicuous:

#### PINUS AUSTRALIS,

Before mentioned—the timber of this tree is naturally adapted to building purposes, and for other mechanical arts; and large quantities are consumed for lumber and exportation. It is known to lumber men as "yellow pine," and has always held the highest rank as merchantable lumber, from its compactness and fineness of grain. This is owing to the lightness and poverty of the soil in which it grows (it being only found in sandy soil), which gives but

a thin annual deposit of wood. The "annual rings" of growth are small, hence the wood is more compact and of closer texture than in richer soils, where the tree grows more rapidly, and is of coarser texture. A tree of the same size will consequently be of much greater age and with more heart wood than one growing elsewhere.

PINUS TAEDA—PINUS MITIS.

These are known as "short leave pines," and are not so abundant as they are in the low country. Timber of inferior quality.

PINUS INOPS.

This is a smaller tree, and grows sparingly on the hills.

QUERCUS FALCATA.

This is the largest of the oaks of this region, and only found on the lands of better quality. It grows to a large size, and makes an ornamental shade tree of regular shape—commonly known as "Spanish oak," or "red oak."

QUERCUS OBTUSILOBA.

The wood of this tree is remarkably hard and durable, and is much used where toughness and strength are required. The young trees are used for making baskets. "Post oak."

QUERCUS CATESBÆI.

Very abundant, and only used for fire wood. Its timber being of no value. "Scrub oak."

QUERCUS NIGRA.

An oak of medium size, with handsome regular head, and makes a tree ornamental and compact. "Black jack."

## QUERCUS CINERIA.

Grows only on the poorest soil, and does not attain a large size. "Turkey oak."

## QUERCUS AQUATICA.

This is one of the finest ornamental trees for lawns and about buildings. Though doing best on damp, rich soils, will grow almost any where with a little cultivation. "Water oak."

## ACER RUBRUM.

Grows mostly on rich soils, and makes a fine shade tree in damp lands. "Red maple."

## LIQUIDAMBAR STYRACIFLUA.

A handsome ornamental tree of moderate size, doing best on good soils. "Sweet gum."

## CRATAEGUS AESTIVALIS.

A small ornamental tree, bearing a large and sub-acid berry, much prized for preserves and jellies. "Haw."

## DYOSPIRUS VIRGINIANA.

Persimmon.

## CERASUS CAROLIANUS.

This tree, though a native of the seaboard, flourishes here with very little care, and is considered an indispensable adjunct in every shrubbery garden. "Wild orange—mock orange."

## MELIA AZADARACH.

This beautiful and fast growing exotic may be said to be naturalized and self-propagating. It furnishes a beautiful shade tree, very ornamental in its foliage in summer, and the heavy clusters of yellow berries in winter, which are said to correct wormy conditions in cattle, which are fond of eating them.



A strong decoction of the bark, leaf, or berry, has been found to destroy insects and worms in cabbages, etc., while no insect infests its foliage. The inner bark is also an excellent vermifuge for man or beast. "China tree."

Of the smaller ornamental shrubs, worthy of cultivation, may be mentioned the following :

KALMIA LATIFOLIA.

This beautiful shrub is found in great abundance about the hills, and by its showy clusters of pink and white flowers adds charms to the spring season in our woods. "Calico bush."

AZALEA CALENDULACEA.

A small shrub, flowering in clusters, and varying in color from deep red variegated with yellow, to bright yellow and rose colored—all of which are often found growing near each other. "Flaming bush."

AZALEA NUDIFLORA.

One of the earliest and most showy ornamental shrubs. "Wild honeysuckle."

AZALEA VISCOSA.

This Azalea blooms later in the season—color white and red.

CALYCANTHUS FLORIDUS.

Found in the rich shaded woods along the margin of water courses. It is worthy a place in every garden, for the sweet freshness of its flower, and the great profusion of bloom. "Sweet scented shrub."

## ROBINIA PSEUDO ACACIA.

A tree of moderate size, with white pendant clusters of flowers. The wood is very durable and hard and useful for many purposes; an elastic wood. "White locust."

## ROBINIA HISPIDA.

This handsome shrub grows in our woods, and is very attractive with its showy racemes of rose-colored flowers.

## ILEX OPACA.

A well known evergreen.

## CORNUS FLORIDA.

Enlivening the woods in the early spring with its large white calyx leaves. "Dogwood."

## CERATIOLA ERICOIDES.

This beautiful evergreen shrub is one of the characteristics of the sand hill country, growing only on the poorest soils. It can be successfully transplanted and reared in a garden. It would compete with many of the rare exotic conifers which are so highly prized. It rarely grows higher than four or five feet, and forms a compact and regular shrub, with small rigid linear leaves. "American heath."

## SMILAX PSEUDO CHINA.

A handsome climber of rapid growth, with bright evergreen leaves, and clusters of black berries. "China brier."

Of the smaller herbaceous plants, annuals and perennials, which attract attention, and are worthy the attention of the florist, may be mentioned

LUPINUS VILLOSUS.

With its rich velvety green leaves all winter, and showy spikes of purple flowers in early spring. It is well worth cultivating. "Hairy supine."

LITHOSPERMUM HIRTUM.

This, as well as the preceding, is a perennial, which is highly improved by cultivation, blooming early in spring, with a profusion of bright yellow flowers.

AMSONIA CILIATA.

Flowers early in the spring, pale blue.

VIOLA.

Several species of this modest but beautiful flower bloom early in the spring, and some transplanted by myself improved very much in size from cultivation.

EPIGÆA REPENS.

This evergreen creeper, which grows as far north as Canada, and blooms in the New England States in May, begins to show its delicate pale pink flowers as early as February. "Ground joy."

IRIS VERNA.

This delicate little Iris, with its sweet scented flowers, opens its petals in early spring, and would be ornamental for borders of beds in a flower garden.

PHLOX SUBULATA.

With its dense tufts of evergreen rigid leaves and

showy flowers, blooming in April and May, makes a beautiful bordering for beds. There are two or three other species of Phlox, all ornamental.

#### YUCCA FILAMENTOSA.

This Yucca is indigenous to the Sand Hills, and with its rich evergreen leaves and tall panicle of large white flowers, is highly ornamental. The leaves may be stripped into shreds and used for cordage. "Silk grass."

#### YUCCA GLORIOSA.

This species has been brought up from the sea coast, is perfectly climatized and hardy, and bears its flowers in a large panicle, consisting of racemes. This plant is used in some places to form hedges, and forms a most effective break to washing sand.

In addition to these we may mention the Fringe Tree (*Chionanthus Virginica*). A beautiful shrub, with glossy, large green leaves, bearing its flowers in panicles, and as it blooms very early in the spring is very desirable as an ornamental shrub on lawns. There are also some very showy and beautiful plants among the composite flowers, some of which have been mentioned in the first part of this work, and which, if cultivated, would make showy additions to the garden flora.

LESPEDEZA STRIATA—HOOKER AND ARNOTT—HED-  
DYSURUM STRICTUM—THUNBERG—FLO. JAP.

Stem prostrate and assurgent, diffusely branched, and clothed with retrorèsly appressed hairs; leaflets small, oval-elliptical, emarginate and mucronate,

with pellucid, parallel veins. Stipules large, persistent, numerously ribbed, pointed. Flowers axillary, on short pedicels. Calyx lobes about half the length of the corolla, obtuse, colored and veined, with two brackets at base. Corolla small, rose-colored and tipped with purple. Legume roundish, hairy, pointed, scarcely larger than the Calyx, one seeded. An annual, springing up early in the spring, flowering September and October, and maturing seeds in October. A native of China and Japan, introduced and now climatised, and extending all over the country.

As the seed of this plant is very minute and difficult to collect, it may be preserved by scraping up the earth from the surface upon which it has shed its fruit, and broadcast it where it is desired to sow the seed.

Among the exotics of our gardens there are two which merit notice, both on account of their beauty and the readiness with which they grow without shelter. *Camelia Japonica* grows readily in the open air, often attaining a height of ten feet, and blooms in the latter part of winter.

#### LAGERSTREMIA INDICA.

A beautiful shrub, growing in this climate to the dimensions of small trees, which, when covered by their dense purple blooms or panicles, almost obscure the foliage, present a most gaudy appearance, and adding very materially to the beauty of the lawn. Two clusters of these trees may be seen in Col. Milledge's lawn, on the Sand Hills, near

Augusta, Ga., which afford most delightful bowers, excluding, by the density of their foliage, the direct rays of the sun.

In the preparation of the above sketch I have received valuable assistance from my friend, Mr. Henry W. Ravenel, an experienced and scientific Botanist, so favorably known as the author and publisher of the "Fungi Exsiccata" of South Carolina.



## PART THIRD.

*Agricultural Resources.*

In the preceding part of this volume casual allusions only have been made to the great agricultural resources of the middle belt of Georgia and South Carolina.

Previous to the late civil war, which in its result destroyed the most expensive system of labor ever imposed upon a nation, our statistics show that the South, notwithstanding this drawback, was the most productive Agricultural region in the world in proportion to her population, as will be seen by reference to the United States Census. These results, however, were produced at the expense of much unnecessary labor, principally through the neglect of those aids to agriculture, which the ingenuity of man in less favored and more densely populated countries had adapted to the various necessities growing out of the importance of economizing labor. Another result, too, of our system was the exclusive devotion of labor to agriculture, and the neglect of manufactures—hence, though much money was made, and the sea was whitened by the sails which transported our produce to enrich other nations, a very large proportion of the profits was paid out for the very cotton

taken from us; so that, notwithstanding our great productiveness, we were really a poor people when contrasted with the consumers of our staple. This was not owing to the superior energies of the purchasers, as some claim, but to the neglect of a division of labor among ourselves. This fact was often presented to our minds by various writers, but so infatuated was the Southerner with the idea that cotton, rice, and tobacco planting were the most lucrative investments for his money, and the only employment for a man of capital, that as soon as money was made by trade, it was, in nine cases out of ten, invested in land and slaves; and cotton, rice, tobacco and sugar continued to monopolize the labor which could have been better appropriated to those productions with which we were compelled to supply ourselves at an enormous expenditure of money.

This condition of things has now been done away with by the disruption of the relations between proprietor and laborer, and we are therefore constrained to appropriate our limited capital to those investments which yield the greatest profit, and thus avail ourselves of the varied resources and rich fields for enterprise which await the industrious and thrifty laborer. Agriculture, however, must occupy the most important place in the South, since our climate and soil are so admirably adapted to the successful production of cotton, sugar and rice. These products, so remunerative before the war, under the old system of labor, will prove far more profitable under the new, necessitating the employment of more care in the preparation of land, the economy of labor in the cultivation of less land, by the introduction of im-

proved agricultural implements, and the careful and more judicious application of fertilizers. Already do we see the beneficial results of improved agriculture on our great staple, cotton—for, whereas, one bale to the acre was considered, before the war, an enormous yield; we now hear of two being made in many places, and some are even sanguine of producing three; and this on land heretofore considered as nearly worn out. That destructive system of abandoning old land for new, and leaving the bare field to the washing of the storms, finally to grow up in scrubby pines, though injurious to the succeeding generation, saved the planter of that day an outlay for expensive fertilizers, and the labor of preparing manure for his fields must ultimately have resulted in the entire abandonment of this worn-out region, then so considered, for the virgin alluvial soils of the West and Southwest, and, consequently, one of the finest regions of the world would have been left to desolation and sterility. We, therefore, may consider that the new order of things will prove a blessing to us, since we are now compelled to become less migratory in our habits, and to settle down as a permanent population, from which will necessarily spring wealth, education, improvement in agriculture, the introduction of manufactures, and the development of the great and varied resources of our favored land. The history of empires show that the greatest nations have existed in even a warmer climate than our own, and now, since the idea—which an over zealous advocacy for African slave labor propagated—that the white man could not labor in the South has been dispelled by

subsequent observation, and the experience of the war, we may safely say that the greatness and prosperity of this country cannot be estimated by any known rules of political economy. Sun strokes, so common at the North, seldom occur here—our armies rarely sent into the hospitals cases of this kind. And when we contrast the dusty road of a marching army, the uniform of the soldiers, with his heavy load of weapons and ammunition, with the field and the light clothing of the ploughman, and the ability of the latter to lay by in the heat of the day, we may be excused for dogmatically saying that the field laborer in our region runs no risk of a sun stroke.\*

The history of the cotton culture in this country demonstrates the readiness with which man appropriates the advantages of soil and climate to the exigencies of his demands. When the first crop of cotton was sent from South Carolina to England, which consisted of only a few bales, it was said that the market was glutted by it, and it was not then even believed that so much could have been produced in the Carolinas. Gradually this demand has increased with the supply, and now not only England but our own manufacturing States have been enriched by the product of our fields, and the demand is still for more. This demand the South can supply, if we can only obtain the labor.

The land only awaits the ploughshare, as there are thousands of acres already cleared, prepared for the farmer. It only requires the seed to become

---

\*The writer was consulted to-day by quite a neat, pretty, and delicate white girl, of 16 years of age, who had been working all summer in the cotton field, hoeing and picking cotton, without any inconvenience to health.

fruitful, and yield a greater equivalent than any crop in the world.

Cotton planters have heretofore considered ten acres about as much land as could be attended by one horse and man, and at the average yield before the war he was considered to do well who made five bales to the hand. It has now been proven that two bales can be made to the acre—and allowing that manuring and more careful culture would require two horses and two men to the ten acres, there would be a yield of twenty bales, or double the amount per acre and hand. At an average price of 20 cents per lb., \$2,000 would be the result of two laborers, and deducting seven hundred dollars for labor, manures and all expenses, a clear profit is left, greater than that from any investment which could be made. When, with this profit, we recollect that the farmer makes no outlay for food, house rent, etc., it will be readily seen that the occupation of farming in this region must necessarily be the most lucrative investment of capital.

These advantages pertain equally to the small farmer as well as the large landholder, since his profits would even be greater in proportion, as he pays nothing for labor—the work being performed by himself and family.

### *Ramie.*

Besides cotton, ramie will become generally cultivated. The following article, from the *Chronicle and Sentinel*, by P. J. BERCKMANS, Esq., shows that it is well adapted to our soil :

We copy from the "*Maryland Farmer*" the following article upon this new textile plant. We have had the

ramie in cultivation since the Spring of last year, and have succeeded remarkably well with it. On the first of August last we planted two thousand small plants, not one over six inches in height; they were raised from cuttings taken from older plants, and were set out in a gravelly loam, fertilized with twelve loads of stable manure to the acre. The land, if left unmanured would, in average seasons, produce about ten bushels of corn to the acre. By September 15th, the young ramie plants had attained a height of four feet, and had thrown up from six to ten shoots each. Layering was then performed, but rather too late in the season to give the young layers time to get well established, as only one-half of these have now sufficient roots to stand the winter. The plants layered in August are very strong. A few of the plants set out in August were left unlayered; they gave canes seven feet high by the 1st of November. The amount of fibre yielded by one cane is remarkably large, and of extremely fine texture. Judging from the results of last late planting, we are satisfied that the advantages claimed for the ramie, and as set forth in the following article, can be relied upon.

We would, however, remark that as the ramie is a perennial plant, and a plantation of it can be called *permanent*, deep and thorough working of the soil, as well as a good manuring, are absolutely necessary before setting out the plants. The soil should be free from Bermuda grass, and be kept frequently worked until the layering of the canes. The roots of the ramie are of a fleshy and succulent texture, and penetrate the soil to a depth of two feet or more.

#### MODE OF PROPAGATING.

A rich, sandy soil is the most suitable for ramie cultivation, and is particularly desirable for a nursery, where plants are to be rapidly propagated. For field culture the plant will thrive in any good sandy land.—To secure a rapid and vigorous growth of roots, the land should be thoroughly and deeply broken up to a uniform depth of about ten inches, and well pulverized. This is highly important, and should be carefully performed to insure a rapid accumulation of roots.



In propagating, level cultivation is preferable; root cuttings should always be used for first planting.

After the ground has been thoroughly prepared as above directed, the roots should be planted about six feet apart each way, three inches deep, and slantingly, with about one inch exposed above the surface; care should be taken to keep the ground moist around the roots when first planted. No further attention, with the exception of weeding, is required until the sprouts are about two feet high, when they should be gradually and gently inclined toward the earth. When they have attained a height of three or four feet it will be noticed that they become of a brownish color near the root, they are then ready for propagation; incisions should then be made with a thin, sharp-pointed knife, at each eye of the stem, which should then be bent gently down, and covered with about three or four inches of loose earth, care being taken to avoid detaching the stem from the parent root. About six inches of the leafy end should be left uncovered. In the course of three or four weeks these layers will have taken root, and may then be separated from the main root, divided in pieces and replanted. In planting in the field, layers may be laid down without being divided.

#### FIELD CULTURE.

After the ground has been ploughed deep and thoroughly broken up, it should be laid off in beds running the length of the field; these should be made six inches high and four wide, with a flat surface; passages three feet wide should be left on each side, and crossways at intervals through the field. A shallow furrow might be run down the centre of each bed; if roots are to be planted, they should be put in the ground slantingly, three inches deep apart, with end projecting above the ground; if layers are to be planted, they should be laid in a furrow, about three inches deep, horizontally, with the ends lapping as in cane planting. After the first year's growth has been cut, new sprouts will issue from all parts of the bed; the growth will become very dense, and choke out all other vegetation.

#### HARVESTING.

When the stems have attained a height of six or

eight feet, they are then ready to be harvested; but should it be inconvenient for the farmer to commence cutting at the time, the fibre will not be seriously injured if left in the field for a week or two longer.—In cutting the stems an ordinary cane knife may be used, care being taken to cut the stem a little below the ground. It will also be advisable to extract the fibre when the stems are not too dry, as that labor is then much more easily performed, and the fibre is of a better quality if broken out while in that condition. A simple and easily worked machine, similar to the ordinary flax breakers, is being constructed for that purpose, with this the planter can make his crop marketable at small expense. In preparing the fibre for packing it should be done up in hanks, and packed in bags or bales like cotton. All refuse matter, such as leaves, the woody substance of the stem, etc., should be strewn over the field; no other manure is required.

#### GENERAL INFORMATION CONCERNING RAMIE.

Ramie may be planted at any growing time of the year—the Fall and early in the Spring being the best time for starting. It cannot be injured by cold, unless the ground freezes to a depth greater than six inches, and continues frozen for several days. Many persons suppose *Bæhmeria Tenacissima* and China grass identical; this is not the case, although they belong to the same family of plants. The China grass produces seed from which it can be propagated, but the system is difficult, and the fibre unequal to ramie in texture.—*Bæhmeria Tenacissima* can be propagated only from root cuttings, and is the finest variety of the *Urticaceæ* family. In commercial parlance the fibres of the *Bæhmeria Tenacissima* and the *Bæhmeria Nevia*, or China grass, are called China grass. In preparing the fibre for the market it will be to the advantage of the producer to ship it in its crude raw state, as very little expense will be incurred in so preparing it. In this condition, as before stated, it is worth ten cents in specie per pound. In preparing it for the spinner, chemical process and costly machinery would be required. A factory for this purpose will be erected in New Orleans during the coming Spring, and planters and farmers will at all times find a ready market for fibre in this city.

THE NEW TEXTILE PLANT, FOR SOUTHERN CULTIVATION:  
WITH A FULL DESCRIPTION OF ITS USES, MODE OF  
PROPAGATION, CULTIVATION, ETC.—BY J. BRUCKNER,  
NEW ORLEANS, LA.

This new textile, lately introduced to Southern Agriculturists, is a native of the Island of Java, and was first brought to Europe, for investigation, in 1844, where it received the botanical name of *Bahmeria Tenacissima*, and, by the beauty and strength of its fibre, attracted much attention in manufacturing circles. Since that time every encouragement has been given to producers in the East Indies to induce them to cultivate ramie in a sufficient quantity to supply the demand; the result is that a considerable quantity is annually received in Europe and manufactured into fabrics of the finest quality, excelling in strength, beauty and finish, linen of the finest texture, and rivalling even silk in lustre.

Since its introduction into the United States, in March, 1867, it has excited much interest among European manufacturers. They consider the fibre of the *Bahmeria Tenacissima* superior to that of any other textile plant, and very valuable for manufacturing purposes; the supply from the East is entirely inadequate to fill the demand, and unequal to the fibre here produced in quality; they are, therefore, very desirous of seeing ramie successfully cultivated in some country where the yield will be large and regular.

ADVANTAGES OF RAMIE OVER COTTON AND OTHER  
STAPLES NOW CULTIVATED IN THE SOUTH.

The soil and climate of the Southern States are particularly adapted for the cultivation of ramie, which requires a loose, sandy soil, and temperate climate.—These advantages can be secured in any of the cotton growing States.

At the present time most of our planters and farmers are financially crippled, and cannot afford to expend the large sums necessary to secure the labor to make cotton and sugar profitable crops; both of these articles require large capital and continuous cultivation to bring them to perfection, and both may be injured or destroyed by unfavorable seasons, or other causes.

Cotton may be totally destroyed by the army worm, or other insects. The fibre of the ramie being contained in the inner bark of the stem, cannot be injured in that way, and will not be hurt by either long continued wet or dry weather; besides it requires small capital to start a ramie plantation, the plant being easily propagated and cultivated; it is perennial, and will not require replanting.

Having been interested in ramie culture since its introduction in Louisiana, in 1867, I have given my undivided attention to securing its successful introduction and cultivation, and bringing its worth and usefulness properly before the Southern public. I have made frequent experiments in extracting the fibre from the stem and preparing it for use, and have tried plants grown in this and other States with the most satisfactory results. I find that our fibre is even finer than that of Java, and that the yield per acre is greater. In any of the Cotton States ramie can be harvested at least three times a year, each harvest or cutting will produce between nine and twelve hundred pounds, making an average annual crop of about three thousand pounds of crude unprepared fibre, worth at present in Europe ten cents specie per pound. In preparing the fibre for manufacturing purposes it loses about one-half, and increases in value sixty-five cents per pound. Thus, it is apparent that ramie, requiring little or no tillage to produce such magnificent results, is the most profitable crop that the planter can cultivate.

The fibre, when prepared for the spinner, is beautifully white, soft and glossy, closely resembling floss silk in appearance; it is much stronger than the best flax, and really receives the most difficult dyes without injury to its strength or lustre.

*Maize or Corn*

Is, next to cotton, the most generally cultivated staple. Of all the cereals it is perhaps the most productive, yielding, as a general thing, more grain to the acre, and more directly applicable to the wants of the farmer, than any other grain, since it not only serves as food for himself, but also his working animals, hogs, etc. The yield is not as great here as it is in some of the Western States, owing to the careless manner of cultivating it, and the neglect of fertilizers. When it has been cultivated with a view of making a large yield to the acre, for the prize cup of some agricultural society, it has been known to produce as high as one hundred and twenty bushels to the acre. The general price of this grain on the coast, from Maine to Florida, may be said to be about one dollar per bushel.

In this climate it may succeed the wheat crop when economy of land is desirable—thus two crops, one of wheat and one of maize, may be obtained from the same land in one year. This has been frequently done. The quantity of this grain necessary to maintain a farm horse in full vigor, with long forage, is about twelve or sixteen pounds each. It is generally fed in the grain, but is better ground, when a less amount is necessary. Its leaves are used as long forage, and considered equal to the best hay, while the stem is often substituted as litter for the cattle pen, it being an excellent absorbent of urine, etc., rotting very readily for the purposes of manure.

During the late civil war it was found that about three-quarters of a pound of this grain, ground into meal, would support the strength of one man, and maintain him in perfect health. It was very often the only farinaceous food used in the hospitals in Virginia for convalescents; and though it was said and believed by many to have been the great cause of the mortality among patients suffering from chronic bowel affections, yet there was no reason to attribute the fatality exclusively to this article of diet, after the patient had been habituated to its use. The army of Northern Virginia, under General Lee, certainly experienced as much exemption from this disease as did the United States soldiers, who enjoyed an abundant commissariat and all the hospital luxuries with which that army was supplied. The abundance of oil in this grain shows it to contain, in this respect, one of the essential nutritive qualities of food; and as an indication of its healthfulness as an article of diet, the Georgian is certainly a favorable illustration, since it is among our people really the principal farinaceous food; and there is not a finer race of men or women to be found in any region of the world, both for personal appearance and vigor of constitution. The long journeys performed by the Indian runner, with no food but a few pints of parched maize, is a practical illustration of its strength-sustaining property; and as an article of diet, when prepared by a Southern housekeeper of the olden time, there was certainly nothing more delicious. Those who are only familiar with the "Indian pudding" of the Northern table, can form no idea of the



variety of breads made from it by a Southern cook. As compared with wheat, rye, oats and barley, this grain as an article of food may be estimated as one third cheaper.

### *Wheat.*

The almost entire devotion of labor to cotton and maize, and the appropriation of fertilizers to these productions exclusively, has produced a very erroneous impression as to the adaptation of the soil and climate of Middle Georgia and South Carolina to the production of this grain. A few isolated experiments, made before the war, in both clay and mixed lands (viz: clay and sandy soil), proved that these lands are well adapted to the cultivation of wheat as a crop on a large scale, and but for the present high price of cotton, and the certainty of the crop, there are many farmers who might be induced to enter into its almost exclusive production. The higher price of southern wheat in northern markets, owing to its "superior dryness and unfermentable qualities" as asserted by a writer in *DeBow's Review*, should recommend it to the agriculturists who may come among us. This writer states that southern wheat often weighs 70 lbs. to the bushel. So far as I have been able to ascertain, the greatest yield on well manured clay land, in this State, has been about forty bushels, or nearly two thousand eight hundred pounds to the acre. In this State, and South Carolina, this cereal has few enemies, as yet, to injure its productiveness—such as the fly, thread and joint worm, so destructive in Virginia—and though the rust and smut occasionally injure it,

there are certain varieties of the plant which have so far escaped the ravages of this fungus. It, therefore, may be looked upon as almost a certain crop, even with the present careless manner of preparing the land and seed, and the absence of fertilizers to stimulate healthy and vigorous growth; and when the same care and skill are applied to it as have been devoted to cotton and corn, there is no reason to doubt that we shall become large exporters of this important article of food.

### *Rye.*

This grain has generally been sown by our planters as green food for young cattle, in the spring of the year, and is scarcely ever harvested in the grain. So far as I have been able to ascertain, it is a certain crop, and has generally produced as abundantly as wheat. It is never used, out of our cities, as an article of diet; and, therefore, little is brought from the country, being mostly imported from the north. The certainty of its maturing here recommends it to the consideration of the farmer, and as our cities are filled up with a foreign population the demand must increase, and it will eventually become an article of home production. Already is the value of this grain beginning to be appreciated by the southern farmer, and but for reasons before mentioned, it would no doubt receive the consideration it demands from our agriculturists.

### *Oats*

Are found to yield as abundantly as any of the other grains, and are generally sown in the autumn, though they have been found to produce equally

well when sown in the spring. If not as heavy as northern oats, their value is materially increased from the fact of their coming into market much earlier.

### *Barley,*

On our clay lands, produces equally as well as any of the other grains, and is generally used as a green, winter and spring pasturage.

### *Cow Pea (Vicia).*

This legume is generally cultivated throughout the whole region of Georgia and Carolina, from the sea-board to the base of the Blue Ridge mountains, ranking next in importance to corn and wheat, in the estimation of the planter, both as forage for cattle and food for man. The yield is from six to twenty bushels per acre, and sells in the cities at about the price of corn. As feed for horses it is considered apt to gripe, but it is said, when boiled or simply scalded with hot water, to be the best of feed for milch cows, as it is thought to stimulate the secretion of milk. In the low country it was given as a ration to the plantation laborers, and was much relished by them when boiled with a piece of bacon ; indeed, it often entered into the culinary department of the mansion, and several very fine dishes were made with it. During the war there were many families, who, with corn meal, made it their principal article of food, as being the cheapest and most nutritious food to be had. As a fertilizer, and renovator of old and worn lands, it was introduced to the notice of the planter by Mr. Ruffin, of Virginia, who, by its use as a green fertilizer, restored several places to their original fertility.

The experiments in relation to its fertilizing quality verified the predictions of Mr. Ruffin.

When broadcast upon the unploughed land, and turned in with an ordinary plough, about four inches deep, in the early part of May, it will produce its flowers about the latter of July, and is then said to be in the best stage of growth for ploughing in as a green manure. About the first or middle of October the land may be sowed in wheat. A friend in Virginia, who tried this experiment in some worn-out land, assured me that it had brought his lands to a high state of fertility, and that he would rather do without guano or the super-phosphates than the pea. When crab grass is allowed to grow with the pea, and is cut with the vine for hay, it is said to make the most nutritious of all forage, and is ravenously devoured by cattle as well as horses.

### *Roots.*

In no vegetable productions do our soil and climate show their superiority over any other part of the world, and adaption to the wants of agriculture, than in the large return careful labor receives from this branch of agriculture.

### *Sweet Potato.*

A yield of four hundred bushels to the acre is not an uncommon result from the proper cultivation of this root; and when it is considered in its various relations to the economy of the farm, its value cannot be overrated. As an article of diet for man, it is both nutritious and digestible; and for cattle and hogs it is one of the best fatteners. A

hand may cultivate five acres with the other produce of a farm; and after gathering as much as may be necessary for a winter's supply on the farm, the hogs may be turned into the field, when they will very soon fatten upon the remainder. This root generally sells in our market towns at from seventy-five cents to one dollar per bushel; and if shipped to the Northern cities, in the early season, always brings very remunerative prices to the shipper. As they are easily damaged by frost, it is necessary to protect them against the weather, which is generally done on the plantation in a very simple manner. The roots are piled on the ground in hills of about twenty bushels, covered over with cornstalks, which are in turn covered with earth several inches thick; over this is placed a rude shelter to keep off rain. By this simple means the root is effectually protected until the spring, when they are again planted out.

Cow-pen manure, and the phosphates, have been found the best fertilizers for this root, as well as for all others.

### *Irish Potatoes*

(As the "Solanum Tuberasum," or common potato is called, in Georgia and South Carolina), return an abundant yield to the agriculturist; but as they mature quite early in this climate they generally become unfit for winter use. They are commonly planted with us about January or February, and are ready for use as early as June, and may be permitted to remain in the ground until August and September. It is very probable that if planted in July they

might be easily kept all winter, but as the experiment has never been tried on a large scale, it might not prove successful. Very large quantities are shipped to northern ports in the early season, and the enterprising gardeners of our Sand Hills and seaboard have made large sums of money by shipping them.

### *Beets.*

This root grows on the clay lands bordering on the Sand Hill region and the argillaceous sandy soil in the hills, to a very large size, yielding an abundant crop. Its cultivation on a large scale has never been attempted that I am aware of, though it is most probable that its valuable qualities as feed for cattle will come to be appreciated when stall feeding of cattle becomes generally adopted by the farmers, or as a new set of men come into the country. From four to six pounds weight has been produced to the single beet in the garden, and this with no great care in their cultivation.

### *Turnips.*

Like the beet, this root grows well, rewarding the careful farmer with an abundant yield. It is generally sown in the month of September, and allowed to remain in the ground all winter, and is either dug and fed in the pen to cattle and sheep, or else they are turned upon it as winter pasture.

To the dairy farmer its value is incalculable, since it always yields abundantly, and, in connection with rye and barley, he may have all winter green food for his milch cows.



All the garden vegetables are produced in this climate at least six weeks earlier than in the northern States; thus affording to the gardener a most remunerative return in the ready sale they meet with in the northern cities.

### *Phosphatic Deposits and Marl Beds.*

The existence of immense deposits of fossil bones in the Charleston basin, has been known to the numerous geologists who have examined the tertiary regions of South Carolina, but their great richness in phosphate of lime was not actually demonstrated until within a short time since, when Professor Holmes and Dr. N. A. Pratt gave them a careful analysis, and found them as rich in this important element of fertility as the best guano from the Pacific.

“This bed,” says Dr. Pratt, “is found cropping out on the banks of the Ashley, Cooper, Stono, Coosaw, and Combahee rivers, and their tributaries; but is developed most heavily and richly on the Ashley, and no doubt extends along the coast east, and especially west, to unknown limits, and has been found as far inland as forty or fifty miles.

“Near the Ashley river it paves the public highway for miles; it seriously impedes the cultivation of the land, affording scarcely soil enough to give ‘bed to the cotton rows,’ and in many places the ‘rock’ is thrown into piles on the lawns, or into causeways over ravines, to get them out of the way of the plough. It underlies many square miles of surface continuously, at a depth varying from six inches to twelve feet or more, and exists in such

quantity that in some localities from five hundred to one thousand tons or more underlies each acre. In fact it seems there are no rocks in this section which are not phosphates." Various analysis of this deposit show from 30.40 to 55.92 per centage of phosphate of lime, and even greater can be found.

In consequence of this discovery a company was soon formed under the title of "Sulphine Acid and Superphosphate Company," which is now in a prosperous condition, engaged not only in manufacturing the superphosphates, but is also shipping large portions of the unground material to England, and our northern States. Dr. Pratt thus concludes his instructive and valuable pamphlet :

We are in need of capital, labor, mining and manufacturing skill, enterprise and energy. Our mountains are full of gold, silver, copper, lead, iron, manganese, and sulphur. Our midland belt abounds in the purest kaolin or China clay, now daily applied to some new or novel use. Also, in the best of fire-proof clays and sands for glass, pottery, and crucible manufacture, and now is discovered for the first time in the history of America, that which for many years overlooked, is of all else in the State or County most valuable to our agricultural community, for the calcarious beds of South Carolina, heretofore recognized as the most valuable in the world, contains an element of fertility which is destined to remodel our system of agriculture ; restore activity, energy, and life to our people ; give confidence to trade ; spread out the flapping sails of commerce, and impart fertility and verdure to the exhausted acres of the world.

In reading the above description of this phosphatic deposit, it would seem that the China Islands of the Pacific have been brought to our very doors, and that when we have recovered from the paralysis

now affecting agriculture, that we shall commence again with the most favorable conditions which could have been devised to secure certain success.

To the middle and back country of Georgia, as well as Carolina, this discovery is of incalculable value, since it will be available to all portions of the two States, and will no doubt be furnished at half the cost of the Peruvian guano, and even cheaper than the manufactured fertilizers so generally used among us.

In the inexhaustible beds of shell lime and marl deposited throughout the Eocene bed of the tertiary strata, in close proximity to lines of railroad near the Sand Hill region, we have the same fertilizers which have added so materially to the value and productiveness of the sandy lands of New Jersey. With demand for this article, enterprise and capital would soon be found to make these beds available for agricultural as well as building purposes.

The Central railroad passes through this Eocene formation in Scriven, Burke, Jefferson, and Washington counties, containing many fine deposits of shell and shell lime stone immediately in its track, which may be seen along the route, especially in Jefferson and Washington counties. Says Dr. Jones:

We have selected the deposit in this locality for an early examination and report, because it yields lime of an excellent quality for architectural purposes, and because it is inexhaustible, containing lime sufficient to supply every planter and architect in Georgia.

The shell limestone can be obtained in inexhaustible quantities from the sides of the hills, without any excavation, and without suffering any inconvenience from an accumulation of water.

This shell limestone will yield 1030 pounds of excel-

lent lime to the ton. For agricultural purposes it will yield 1837 pounds of carbonate of lime, and  $12\frac{1}{2}$  pounds of phosphate of lime.

The shell limestone of Georgia is richer in lime, and contains less impurities than the majority of the limestones and marls of Europe and of the United States, and is fully equal to the best limestones and marls found in Europe and America.

The shell limestone of Georgia is capable of furnishing lime for architectural purposes equal in purity and quality to any in Europe or America.

The limestone of Georgia is more suitable for agricultural purposes than the limestones of the older formations in Europe and America, in two most important respects :

- (1) It contains less magnesia
- (2) It contains a much larger proportion of the phosphates.

The marls of Georgia are as rich in carbonate of lime as the marls of Europe, and of other portions of the United States.

The marls of Georgia are richer in phosphatic acid and its compounds, than the majority of the marls of Europe and of the other parts of the United States, and are fully equal to the richest marls of Maryland, South Carolina and Alabama.

One of the beds of Georgia marl yielded near seven per cent. of phosphate of lime, and could give to the 300 bushels more than one thousand pounds of the phosphate of lime. Several of the analyses of the marls of Maryland and South Carolina show a higher per cent. of phosphate of lime than those of Georgia, but I find upon reference to the accompanying description, that the specimens were selected from deposits rich in bones and excrements of fish and fragments of corals. I have in my possession bones and corpolites from the shell limestone and marl beds of Georgia which would yield a higher per centage of phosphates even than those of Maryland and South Carolina.

In the marls, then, as well as in the shell limestone, Georgia possesses inexhaustible stores of phosphate of lime.

We may then, with truth, affirm that in this important element of fertility Georgia is independent of the world.

The value of these deposits of marl to the horticulturist is incalculable, since it has been proven by experience that grape particularly is very materially benefited by it. One vineyard, which had, from some reason or other, ceased to ripen its fruit perfectly, produced a prolific crop of most delicious fruit after having been supplied with the phosphate of lime existing in the marl of this region.

### *Fruit Culture—Peach.*

It is only within a few years that the cultivation of fruit has received the attention its importance demanded, since it was discovered that a large portion of the Sand Hill soil was better adapted to it than any other production. The late Mr. William Gregg, the founder of the Graniteville factory, deserves the credit of being the pioneer in this enterprise. He appropriated a portion of his wealth to this branch of horticulture, and set out the first large peach orchard with the view of supplying Northern markets. The investment having proved profitable, others soon followed his example, and very soon fruit, particularly the peach, became an important item of transportation with the steamers running from Charleston to New York. There are now several orchards of a hundred acres in the neighborhood of Aiken, and though they were very much neglected during the war, because of the necessity of devoting labor exclusively to the production of grain, yet they are now receiving proper attention, and it is expected that their former profitableness

will reward the orchardist for his labors. The earlier varieties of this fruit ripen about the 20th June, and command from \$15 to \$20 per bushel in the New York market. It is stated, upon reliable authority, that several persons in that vicinity have realized more than \$500 per acre in favorable seasons. The trees usually commence to bear the third year, and then produce from a peck to two bushels per tree. The disease known as the yellows has not as yet made its appearance, and the land being poor, it is not so liable to those fungus diseases which seem to result from a superabundance of sap and the too rapid development of fruit. The peach grown in the Sand Hill region surpasses all others in flavor, and often attains a size which would scarcely be credited unless seen. The trees are generally planted from sixteen to twenty feet apart, giving from 112 to 175 trees to the acre, and ripen from June to November, according to the varieties planted. Ripening a month or six weeks earlier than the New Jersey and Delaware peach, there is always a ready sale to be had in the northern cities; and when the supply is sufficiently increased to warrant the running of steamers regularly from Savannah and Charleston, to transport the fruit, this no doubt will be done, and thus it must become a certain source of profitable income. There are now several large nurseries in this region engaged in supplying the demand for young trees, since it has been found that our native varieties are not only superior to the northern fruit in flavor and beauty, but are also less apt to suffer from late frosts and mildew. The cheapness of land favorable to the growth of the



peach, enables us to supply the old orchard by a new one when the soil of the first has been exhausted of those elements of nutrition necessary to the perfecting of the fruit, which in the experience of the Delaware growers occurs in about twenty years ; whilst the abundance of woodland enables the orchardist to protect his trees from high winds, which are found to injure very materially the productiveness of the orchard.

### *Grape Culture.*

“Previous to the war,” says Mr. A. de Caradeux, of Aiken, S. C., “we considered the grape culture as the most profitable, and the most certain of all crops. For a lapse of fifteen years before 1863, we had lost but two or three crops from extremely late and severe frosts. Of the rot we suffered but little. The wine made by us was of excellent quality, and sold at very remunerative prices, and we considered that a vineyard of ten acres, attended by one man (a very moderate task), was, on an average, good for an income of \$1,500 or \$2,000 ; some yielding much more and some a little less. In 1862 we had a magnificent crop of grapes, and the wine made from them could not be surpassed in quality or flavor. After that year, the owners of vineyards were either in the army, or when at home were compelled from many causes to neglect their orchards and vineyards in order to make bread. In every country neglect is fatal to the vine. Ours began to fail, and the more they failed the more we neglected them. After the war we were ruined, and reduced to the verge of starvation, without means to live on save by the labor of our own hands, we could not devote any

portion of our own time to a crop requiring two years to pay. We had to make corn. The vineyard was more than ever neglected; the unpruned vines fruited poorly, and the little fruit rotted; all, except the never-failing Scuppernong, that never rots—never fails—care or no care, it makes but little difference with it.

“Before discarding the other grapes, let me impress upon our people my very strong belief that our vineyards can yet be regenerated. Let those who have the means try the experiment. Prune them carefully and heavily, saving strong suckers where the main stem is not sound. Plough them, hoe around them, give them phosphate of lime, keep them clear of grass and weeds, and well tied to the stakes. This belief is strictly supported by facts, in a few vines of my own, and in the entire crop of Mr. Derby, near Aiken. This gentleman lately settled on a place with a large unproductive vineyard. He had large means at his disposal; he tried and did every thing required to regenerate his vineyard, and his labor was rewarded. His grapes were splendid; ripened well, and more than repaid all his outlay. This fact shows conclusively what culture and attention can do for our present neglected vineyards. They did well before the war, when they were taken care of; they failed when neglected; and after the war, the only one which has received proper culture does well at once, while others around it have again failed from neglect. I do not, therefore, consider grape culture a failure, by any means, but think the prospect very encouraging. Should a cultivator, however, wish to discard all the varieties liable to

the rot, let him confine himself to the faithful Scuppernong. This hardy variety never rots, and never fails of a crop. It requires but little pruning to keep it in shape; very little culture; is a strong grower, accommodating itself to all lands, rich and poor, clayey or sandy, dry or wet. The wine made from it is of pleasant flavor; rather weakly when new, but improves with age. When pure it is like some of the Rhenish or Mozelle wines, a little too acid. It is much improved by the addition of alcohol or brandy and sugar. This is scarcely an objection, for it is well known that most of the choicest brands of foreign wines receive more or less of these ingredients. Should many foreigners settle among us, I look for a large and rapid increase of our vineyards, and wine will become an important item of exportation on our list."

Mr. H. W. Ravenel, of Aiken, to whom I am also indebted for the following valuable remarks on grape culture, taken from an instructive pamphlet on the subject, writes :

As our remarks are intended for grape culture at the south, we will here name the varieties which seem to be most in favor at present (January, 1868), as most hardy and free of disease—most productive, and best adapted to lime.

Of these the opinion is almost universally favorable to the Scuppernong and its allied kind. This grape has long been known. It is a native of North Carolina, found in abundance growing wild about Scuppernong lake or river, on its eastern shore. It is undoubtedly one of the chance varieties, or seedlings, which sometime spring up; sports or variations from the usual type, which can only be propagated by layers, cuttings, or grafts. In ninety-nine out of a hundred cases (speaking generally) if the seed is planted, the offspring is a black grape of inferior quality, showing a tendency to resort to the original or wild variety. We have tried

many, perhaps fifty or sixty seedlings of this grape, all selected from seeds of the fruit and best matured grapes, and in every instance the offspring was a black grape. Those familiar with the wild grapes, found in the woods, are aware of the difference in quality of fruit (natives even then showing a tendency toward variation); some vines bearing a nice and eatable fruit, others a small, hard, and inferior fruit. We suppose that the original vine from which the so-called Scuppernong has been propagated, was an accidental seedling of very superior quality (accidental as we understand the term); and as such a good variety was found ready made to our use, by nature's methods, it has been propagated and extended by subdivisions of the original plant. It is not at all impossible that, by the planting of seeds of this grape, a variety even superior to this may be raised.

This process, viz: the planting of seeds and raising new varieties which will be specially adapted to the conditions in which they originate, is the truly rational and most philosophical mode by which we may expect to improve all our varieties of fruit.

The Thomas grape is another superior variety of bullace. For its history, and that of the *Flowers grape*, we are indebted to Mr. Daniel Fare, of Marion District, South Carolina, who sent specimens of the fruit to the "Vine Growers Convention," in Aiken, in 1860, and afterward supplied us with the plants. In his letter he says:

The Thomas grape was originally found near an old camp of Gen. Marion's, at a place known as the "Bowling Green," about four miles above Marion Court House. It ripens about ten days earlier than the Scuppernong, and from four to six weeks earlier than the Flowers. The Flowers grape was first found on Ash Pole swamp, about the border line between Marion District and Roberson county, North Carolina.

These again were chance seedlings of nature's planting. The first of these, the Thomas, is semi-transparent, pinkish, turning nearly black—very sweet, and having an aromatic and honey flavor. We sent specimens of the fruit this season to Mons. L. Merzeau, a French

vinter and wine maker, in the vicinity of Aiken, and he says it is the best of all the bullace grapes he has tried for wine. It is a great bearer, and ripens a few days before the Scuppernong, say about the middle of September, in this latitude.

The Flowers grape is an enormous bearer—berries large, nearly black, strongly attached to the stems, in clusters of ten, fifteen, or twenty; with thick skin and solid, fleshy pulp; ripening about the beginning of October, and hanging on the vine until frost. We have not seen it tried for wine, but it is the best known grape for preserves, jellies, etc. It would scarcely mature beyond the northern limits of North Carolina, but being a late grape, the advantage of having a cool season for the manufacture and fermentation of the wine, may make it a desirable grape for that purpose.

These grapes like all the varieties of the bullace never rot. Their thick skin protects the juices within from the change of seasons, and the late period at which they put forth the flowers is a safe guard against spring frosts. They may be always relied upon for good crops, and in rich soils their yield is very great.

The Clinton (a variety of the small summer grape, a *Vitis Æstivalis*), is now the favorite grape of this class for wine. The berries are small, and the quality not good as a table grape; but the vine is hardy, vigorous and healthy; fruit not subject to disease, and makes a wine of good quality. We have, also, found the "Dr. Pearson," a small black grape of this class very promising as a wine grape, and similar to the Clinton in its character. The fruit is small, and not good for the table, but the vine is very healthy; a good bearer, and has never rotted during the six or eight years we have had it, though in seasons where other grapes have failed.

The Catawba (of the *Vitis Labrusca*, a large grape family) is an old standard wine and table grape, and is still a favorite in many quarters. This, like most others of the *Labrusca* and *Æstivalis* species of grape, feels the effects of adverse seasons, and occasionally rots; though our own experience is that it is more exempt than most others of its class.

In this State (South Carolina) Dr. A. P. Wylie, of

Chester, has been engaged for ten or twelve years in this mode (hybridizing) of improving our grapes. He has planted many hundreds of seeds which he had previously hybridized, and these seedlings are now coming into bearing. We have seen and tested many of the specimens. Among them are many beautiful varieties; some for a table grape, comparing well with the best European kinds; others highly promising as wine grapes. Many of his grapes are such as to leave but little more to desire; they only need longer trial to test their hardiness and their adaptation to our soil and climate.

In 1866, the citizens of Aiken, desirous of attracting the attention of immigrants and others to their neighborhood, appointed a number of their most prominent residents to draft a report upon the advantages of the vicinity with respect to its remedial influences upon pulmonary consumption, and also its horticultural, agricultural, and manufacturing resources, from which report I copy the following remarks, in relation to grape culture.

Around Aiken, nearly 500 acres are now planted in grapes; the vines are healthy and vigorous; the peculiar dryness of the atmosphere; the rolling surface, and the light porous nature of the soil, which quickly discharges all superfluous moisture, makes it especially adapted to the grape culture. The quality of the fruit surpasses that of other sections, both in high flavor and per centage of saccharine matter. The grapes begin to ripen about the middle of July, and are ready for the press some time in August.

The vines are generally planted in rows ten feet apart, and about six feet in the row, making about 750 plants to the acre. They are rarely injured by the frosts. A vineyard once properly started is an inheritance for one's children. Mr. Axe, of Georgia, offered to guarantee twenty-five hundred gallons of wine per acre to those employing him to superintend and plant their vineyards.

Prof. Hume, in an address delivered to the Aiken Vine Growing Association, in 1860, stated that he was



commissioned by New York houses to purchase all the Aiken wines he could get at \$2 per gallon, as dealers in wines found these best for making their "bases."

It is estimated that wine can be produced at twenty cents per gallon, and the demand, even at \$2, is fully equal to the supply.

We thus see from the preceding that the neighborhood of Aiken is well adapted to the vine. The land adapted to the vine culture can be purchased at from two to five dollars per acre. Her citizens are anxious to sell their lands to actual settlers, and will, by their own statements, extend every assistance to those who may come among them to assist in developing the immense resources of that favored and healthful region. These advantages, however, are not peculiar to that immediate vicinity; the whole extent of the Sand Hill region, as described in the physical geography of the region, possesses the same inducements, in point of cheapness of land, productiveness in fruit, healthfulness, manufacturing and transportation facilities.

Mr. P. J. Berckmans, an experienced and highly educated horticulturist, owning one of the most beautiful, extensive and profitable nurseries in the south, has been kind enough to furnish me with a paper on grape culture, read before the Richmond County (Georgia) Agricultural Club, from which I extract the following remarks :

Can the grape be cultivated here with a fair prospect of profit? is a question that is first asked by new beginners. It can be answered in the affirmative, provided the right varieties be planted.

The *Concord* has been pronounced at the North and West the grape for the "million," and the poor man's wine-grape. This is true for those sections; but not for the Southern States. We have a grape indigenous to the country, which is more deserving that appellation

for us: one that will thrive on a rocky hill as well as in a rich bottom; never failing to produce a crop of fruit; never having been known to rot, and, above all, needing no experienced hand to trim it. I refer to the *Scuppernong*. Its capacity of production is fabulous, when compared to other vineyard varieties. Vines planted six years ago, upon land that would not produce ten bushels of corn to the acre, in average years, have produced one and a half bushels of fruit each, and this is the fourth crop. They were planted without regard to the arbor training, under which mode the *Scuppernong* attains its largest size, but simply trained upon a wire trellis four feet high; the distance twenty feet in the row. What will an acre produce at this rate, and what will it produce, if properly trained and planted in a rich soil?

Instances of a single vine covering one acre of ground are numerous, and sixteen barrels of wine its product in a single season. These are exceptions which vine growers must not all expect to realize. But they are merely given as evidence of its wonderful fertility. Its culture is the simplest of all modes, and the outlay required to establish an acre is insignificant as compared with the prices of the new varieties. Enough of the former to plant an acre can be procured for the price of a half dozen *new comers*.

The next best wine grape is the *Clinton*, whose merits are now sufficiently known to give it its rank among the great wine grapes of the country. It is of Northern origin, but improves as it is brought southward. It is very prolific, and makes a heavy bodied claret. Other varieties are coming into notice, and bid fair to make valuable additions to this class of grapes: such are the "Ives Seedling," etc.,

Our good table grapes are becoming numerous. First comes *Delaware*, which seems to thrive everywhere South. *Isabel* bids fair to even excel the *Delaware*; its quality is superior to any of its class; so far it has not decayed, although, from the short time of its introduction South, we cannot form a decided opinion as to its ultimate behavior; still two years' fruiting, during which it bore perfectly sound crops, and this during a period when many other varieties, of like recent introduction, decayed, is a fair beginning

and likely to end well. *Hartford Prolific* is yet our best very early grape. As a profitable market fruit it stands first in order. The bunches and berries are large, of fine appearance, fair quality, and stands carrying to market better than any other variety. It is not so liable to drop its berries as in Northern States. Its earliness will always make it command a high price. *Miles* is better in quality, fully, if not a little earlier but not so fine in appearance.

*Concord* will long remain as one of our good grapes. Its skin is rather too thin to stand carrying to distant markets; but it is very prolific, of fine quality, and will doubtless make a good wine, although no experiments have as yet been tried upon a large scale.

*Ontario* or *Union Village*, when well grown, rivals in size the Black Hamburg. It is a splendid looking grape, of good quality, and has decayed less than many of the heretofore considered reliable grapes. When the *Warren* and *Black July* find a suitable soil and situation, no grape can compare with either in the peculiar texture of the fruit. The vinous flavor of these varieties belongs only to the type of *summer* grape (*Vitis Æstivalis*) from which they originate, and they are all well described by Downing, when he calls them "bags of wine." Other varieties have their merits; but they alone have given more satisfaction generally than others; and we must be satisfied with them, especially if we expect to derive profit from grape-growing; and, until better varieties are produced, we must take them, as they combine variety enough to satisfy the most fastidious taste.

The best soil for a vineyard is a dry calcareous loam, one containing natural salts and a proportionate quantity of vegetable matter. It is futile to expect a heavy grape crop upon soil too poor to be used for the cultivation of corn.

The different varieties of grapes will make different wines. Nearly all the varieties belonging to the Fox grape (*Vitis Labrusca*) will make a *Hock*. They are better suited to the production of white wines than red ones, when used by themselves. The *Catawba*, the *Venango*, etc., give a rough wine when fermented upon the skins. The *Concord*, from its thinness of skin, contains less acrid matter, and will, therefore, make a

palatable red wine. The *Labruca*s should have a portion of *Æstivalis* mixed with them, when a red wine is desired. For instance, Catawba and Isabella, with a third: Clinton, Warren or Black July, will give a superior red wine. The *Æstivalis* class are more akin to the French wine grapes. The Clinton will give a fine Claret; *Ohio*, or *Jacques*, something more resembling a Burgundy; Pauline, Warren and Black July will produce wines varying from a Sauterne to a Madeira. Scuppernong will make delicious Muscatel. Enough for all tastes; and it is to be hoped that as we have the elements of success in our hands, we shall no longer allow them to remain unproductive.

### ***Manufacturing Resources.***

As to the subject of manufacturing and mechanical employment at the south, and within the limits covered by this sketch, we, of course, look first to our natural resources for *working power*. Theoretically, and by the map, we take a range beginning with Richmond on the James river, thence to Weldon on the Roanoke, thence to Columbia on the Congaree river, thence to Augusta on the Savannah river, thence to Columbus on the Chattahoochee, and thence to Montgomery, Alabama, as indicative of a change of level. From all these points upward, the hydrographic indications are favorable to the development of an immense water power, for, besides the streams mentioned, there are others tributary to them, which would chequer this whole range with hundreds upon hundreds of mill-sites, affording employment to thousands of men, independent of the immense agricultural population required for their support.

Within this range, with the power nature has so lavishly bestowed upon us we could, under proper management, undertake to do the whole cotton manufacture required for the world.

Under the old system of labor there was little or no inducement to invest capital in manufactures or in the promotion of the mechanical arts—for, as a general rule, with a productive soil and docile labor, the production of cotton was not only sufficiently remunerative, but a comparatively safe and easy application of capital. Thus, with the production of the cotton field we purchased everything, and made nothing but cotton. Our ploughs and mules, our horses and carriages, our bacon and corn to some extent, and in fact almost every thing required for our work, ease and comfort, came from the North and Europe.

About the year 1845 this question in political economy was gradually demanding solution: "*What are we to do with our surplus white population?*" for we had made our contributions to Texas, California, and other States, and still we had left a very large number of non-producers, whose labor should be made available, not only for their own support, but to the solid advantage of the State. Without system, or concert of action, individual sporadic efforts were made in various parts of the south by some of our philanthropic, patriotic, and energetic citizens, to meet the question by the establishment of cotton factories.

At Augusta, Col. Henry H. Cumming, Andrew J. Miller, and Mr. D'Antignac, took the lead, aided by Hon. J. P. King, John Bones, C. J. Jenkins, and others, and succeeded in inaugurating an enterprise giving employment to thousands, and fully demonstrating the fact that at the south cotton manufacturing would afford the means of employment to our surplus white population, and prove far more remunerative to capitalists than cotton planting.

In our immediate neighborhood (Graniteville) the late Mr. Wm. Gregg demonstrated the same fact.

The lapse of only one-fourth of a century would hardly justify an attempt to give an historical sketch of these enterprises, but, as usual with all such attempts at the South, they had at first to contend with great difficulties mainly from the want of practical knowledge and experience; but now that the enterprise, industry, and capacity of our own people have acquired the necessary training, we are successful.

The quarterly dividend of five per cent. on six hundred thousand dollars made by the Augusta factory, and the favorable report of the Graniteville company, show very conclusively what has been accomplished in this line, and naturally leads to the hope that our resources will at no distant day be fully developed.

The fact stated in the Graniteville report, that the waste on the raw material is about ten per cent., shows how in that item a great saving is made by manufacturing at the South. In a mill using 3,000 bales per year, at ten per cent. waste, there is of course a loss of 300 bales; and while it may be true that they are counted as an element of cost in any goods made at the North or South, it is evident the freight, commissions, etc., on them are saved to the manufacturer at the South. The same remark is applicable to the cost of transportation of the raw material generally, as no one can suppose for a moment that a bale of raw cotton can be sent to Lowell or Manchester, and there made into cloth as cheap per yard as it can be done at the South. There is another advantage, the raw material in transporta-



tion is liable to stealage, etc., from which the manufactured goods are protected, and at the same price per pound for freight, etc., the expense of transportation is of course ten per cent. less on the manufactured than on the raw material. Taking the difference of value into consideration, the difference is even more than this in the expense of transportation.

### *Description of the Augusta Canal.*

In September, 1844, Col. Henry H. Cumming and Hon. John P. King, at their own expense, engaged the services of Mr. Wm. Phillips, C. E., to make a reconnoissance of a line suggested by him for a canal for manufacturing purposes, and securing an abundant supply of water to the city. The examination was made and a favorable report received from Mr. Phillips, which was submitted to the friends of the enterprise, on the 9th January, 1845. Another survey was made under the supervision of Mr. J. E. Thomson, C. E., F. C. Ames, and J. H. Grant, and as their report confirmed that of Mr. Phillips, a public meeting of the citizens was called, and it was determined by them to proceed with the work.

An engineer of some reputation, Mr. C. O. Sanford, was put in charge of it, and made the final location.

The fiscal operation was simple and effective. The City Council issued its bonds for the purpose of defraying the expense, with the understanding that there should be a special tax on real estate sufficient to meet the bonds at maturity. The estimated cost was \$104,000.00, of which the banks subscribed \$4,000. leaving \$100,000 to be raised by special tax.

In April, 1845, the final location was made, and the larger portion of the work put under contract—it was commenced in May following.

The whole fall of forty-five feet was divided as follows, into three levels: The first level extending from Bull sluice to near Marbury street, about  $6\frac{7}{8}$  miles in length, with a bottom slope of about six inches to a mile, reduced the fall to 41.36 feet, and from the first to the second level extending from Meig's brickyard to McIntosh street, the fall is 15 feet, and the fall from the second to the third level, which extends from the Savannah road to Hawk's gully, is about 13 feet. The fall to the river is variable, and may be taken at from 13 to 20 feet, according to the state of the river. It may be well to mention that this last fall was deemed of little importance in consequence of being subject to back water from the river.

All these levels, near nine miles in length, were made with the same sectional area of water-way, the bottom being twenty feet wide, side slopes two to one, and water five feet deep. It was found, however, after some time, that the improvements made in cotton machinery, by which it could be run at a much higher rate of speed than was supposed at the commencement of this work, would require more water, consequently the banks of the first level of the canal were raised, also the dam in the river, and extended so that in the first level we have about eight instead of the five feet in depth, as originally. In the other levels the depth is as first mentioned.

To afford a definite idea of the result of this canal enterprise, the following is taken from the published reports of Mr. Phillips :

AUGUSTA FACTORY.

Report of work, etc., for the year ending August 31, 1866 :

Capital Stock.....	\$600,000 00
Operatives.....	615
Spindles .....	14,340
Looms.....	463
Cotton used.....	2,232,000 lbs.
Wood.....	800 cords
Oil.....	2,600 galls.
Starch.....	52,000 lbs.
Production—Sheeting.....	3,573,000 yards
Shirting.....	2,434,000 “
Drills.....	403,000 “
Water Power—3 Jouval Turbines, 85 horse-power each	
3 “ “ 60 “ “	
Equal to 434 nominal horse-power.	

GRANITE MILLS.

2 overshot water wheels—60 horse power.

4 run of 4½ feet stones.

4 operatives.

Corn ground.....	8,000 bushels
Wheat ground.....	8,000 “
Other products.....	2,000 “

AUGUSTA MILLS—FORMERLY CARMICHAEL'S.

2 cast iron turbines—60 horse power.

4 run of 4½ feet stones.

6 operatives.

Corn ground.....	40,000 bushels
Wheat ground.....	8,000 “
Other products, bran, and feed as usual.	

## DANFORTH'S MILLS.

1 cast-iron turbine—30 horse power.

1 run of stones.

2 operatives.

Corn ground.....13,000 bushels

Wheat ground..... 2,400 “

Other products of bran and feed as usual.

Barrel Factory not in operation.

## FALLS MILLS—NELSON &amp; MCILWAINE, PROPRIETORS.

(GRIST MILL AND TOBACCO FACTORY.)

One 45 horse power cast iron water wheel.

Corn ground last year, 50,000 bushels.

This is, also, the “Pioneer Tobacco Factory” of the State of Georgia. The proprietors having successfully introduced that important branch of industry three years ago.

## STOVALL'S EXCELSIOR MILLS.

4 water wheels, cast iron turbines—60 horse power.

4 run 4½ feet stones. 2 millers. 5 laborers.

Wheat ground.....44,152 bushels

Three teams engaged in the business of the mill.

## PARAGON MILLS.

Mill burnt—about the same capacity as the above.

## GOVERNMENT BAKERY.

15 horse power—now used as a machine shop by Pendleton & Boardman.

## AUGUSTA WATER WORKS.

1 Jouval turbine—45 horse power, working two double acting plunger pumps.

Water supplied to the city for the year ending 31st August, 1866.....58,163,023 gallons

## MACHINE WORKS—LATE PISTOL FACTORY.

1 cast-iron water wheel—25 horse power. Abandoned.

URQUHART'S MILLS.

1 cast-iron Howell turbine—15 horse power.	
1 wooden breast wheel—15 horse power.	
2 operatives.	
Corn ground.....	5,250 bushels
Wheat ground....	400 “

C. S. GOVERNMENT POWDER WORKS.

Abandoned.

C. S. GOVERNMENT MACHINE WORKS.

Abandoned. P. Malone using it as a foundry.

RECAPITULATION.

21 water wheels—775 horse power.	
641 operatives.	
15 run of stones.	
Products—Sheeting.....	3,573,000 yards
Shirting.....	2,434,000 “
Drills.....	403,000 “
Total.....	6,410,000 yards
Corn ground.....	116,250 bushels
Wheat ground.....	59,952 “

It may be instructive to pause here, and consider the history of our cotton manufacturing enterprise. It started with forty-seven stockholders, and a capital of \$143,000.

Mr. A. M. Chase was requested to furnish the plans and specifications for a mill. He designed one of 5,000 spindles, which the stockholders deemed inadequate to the requirements, and very sensibly objected to it, insisting that the first mill should have a working power of 10,000 spindles.

Mr. Phillips, civil engineer, was requested to make the plans, specifications, and estimates for a mill of 10,000 spindles, and under the supervision of Mr.

Chase they were made out, and the mill No. 1—216 feet in length, and 54 feet wide, 5 stories high—was erected by Goodrich and Crump, under the superintendence of Mr. Phillips. In this mill, when first started, there were 5,280 spindles; they worked off beautifully, and the first dividend declared was about  $12\frac{1}{2}$  per cent. This of course induced the proprietors not only to fill up their mill No. 1, but to erect mill No. 2.

These mills, as before mentioned, are 216 feet in length, and 54 feet in width, and 5 stories high.

Mill No. 1 contains 8,960 spindles, and 314 looms.

Mill No. 2 contains 5,769 spindles, and 188 looms.

The product of both is 7,886,545 yards for last year. I would here state that under the direction of its able President, Mr. W. E. Jackson, and Superintendent F. Cugin, this factory received the encomium of Senator Sprague, of Rhode Island, himself a large manufacturer, as being the best managed factory in the United States, and regret that want of space prevents me from inserting the valuable semi-annual reports of Mr. Jackson for the last half year.

In this particular instance (the canal and mills at Augusta) we see at a glance what may be done for the alleviation of the condition of our people in the distress caused by the very great change recently made in our system of labor.

Let us take a retrospect of the last twenty or thirty years, and look at the head waters of Horse creek, then a barren waste of chalk cliffs (Kaolin) and pine forest, and we at once see the advantages accruing from manufacturing, which so many were at that time opposed to.

When Mr. Gregg made his first reconnoissance of



this region, then an old field, it was little anticipated that he would soon build upon it, in a few months, a thriving village, where the busy hum of the spindle would be heard, and education shed its influence upon the minds of the then ignorant inhabitants soon to be supported and employed by this enterprising man. See Graniteville as it now stands, a monument of his genius and enterprise, and the thousands of persons benefited thereby.

In a late report I find this statement:

The production of the mill, including cotton on hand January, 1867, and since purchased, expenditures and cost of production, are as follows:

Number of bales in warehouse January 1st, 1867... 85  
Bought from Jan. 1, 1867, to March 1, 1868.....5701

Total on hand and purchased.....5786

The average weight of a bale is 434 pounds, making a total of 2,511,124 pounds. The aggregate cost is \$614,718.95; being at the rate of nearly 24½ cents average per pound. The highest price paid was 33½ cents, and the lowest 12 cents.

The quantity of cloth manufactured during the above period stands thus—

	POUNDS	PIECES	YARDS.
4-4 sheetings .....	1,102,282	81,507	3,182,290
$\frac{1}{2}$ shirtings.....	583,265	52,273	2,038,254
Drillings.....	337,292	17,908	685,908
$\frac{3}{4}$ shirtings.....	227,067	26,645	1,075,249

Total production, 2,249,906 178,333 6,981,701

The average per week is 47,386 pounds, 3,805 pieces, 151,191 yards.

Assuming this average as a basis, the annual production will hereafter be about 8,000,000 yards.

The gross profit, exclusive of the sales of waste, is \$207,693.76.

#### KAOLIN MANUFACTURING COMPANY.

About six miles from the city of Augusta, in the State of South Carolina, stands the Kaolin works,

erected in 1858, by an organized company, chartered the same year by the legislature, with the privilege of issuing stock to the amount of \$200,000, of which sum \$100,000 has been issued in shares of \$100 each. The works were destroyed the last year of the war, and it was found necessary to assess fifty per cent. on the stock issued to rebuild the same. There are now three large kilns for the burning of ware, and one for the burning of fire brick. Workshops large enough to employ thirty or forty hands.

The ware made is an article that will class between the C. C. and white granite. During the time the works were carried on they produced from four to five thousand dollars worth of ware per month, and would have produced more had they been employed to their maximum capacity. All the ingredients to make ware equal to the best English, are to be found in this district (Edgefield, S. C.), if some one thoroughly acquainted with the process of mixing the different materials could be induced to make the experiment. There are large beds of pure feldspar in this neighborhood, and the clays are equal to the very best found in England, according to the statements of persons acquainted with the merit of both. The China clay or Kaolin has been analyzed by Dr. A. A. Norges, State Assessor for Massachusetts, with the following result :

Water.....	12.10
Silica.....	44.46
Alumina.....	39.82
Lime and Magnesia.....	1.86
Per. acid. Iron.....	.602
Titenic acid.....	.943

The supply of the ware manufactured at these works is not adequate to the demand. Laboring under a great many disadvantages, the company has

shipped from two to three thousand tons of 2240 lbs. each, of the Kaolin clay, to the northern manufacturing establishments, and so pure and white is the article as to induce some enterprising person, less scrupulous than he should be, to send it back to us adulterating wheaten flour.

The profit made by the company upon the manufactured material and shipments of clay, is fully equal to seventy-five per cent., demonstrating that a better investment of capital could not be found than the establishment of such works throughout this region, and the enlargement of those already built. The supply of the raw material is inexhaustible, easily reached, laying below the red clay in some places only a few feet, the stratum being immensely rich in some places. The facilities of obtaining fuel are unequalled, and the only want is capital, enterprise, the right kind of labor, and the skill to direct it.

For the above information I am indebted to Mr. G. A. Schaub, Superintendent of the Kaolin works.

The preceding data, selected from a number of facts in our possession, have been selected only to show how profitable manufactures can be made in the Sand Hill region of these States, the reason whereof will suggest itself at once to the practical mind. It is no longer a matter of uncertainty, the fact is continually demonstrated to us that capital invested in southern manufacture will produce results nowhere else obtained, and when we consider the number of mill sites extending along the whole region embraced in the Sand Hill section, with their close proximity to railroads and numerous navigable streams, we may reasonably hope to see before

many years the whole region covered with such manufacturing towns as Graniteville, affording a home to many now idle and ignorant people, when they may be brought under the benign influence of religion and education, and so taught as to become valuable members of society, rather than the drones many of them now are.

The following sketch of the great water power existing in Richmond county alone, is taken from the *Chronicle and Sentinel*.

THE MAGNIFICENT WATER POWER OF RICHMOND COUNTY  
IDLE AND UNDEVELOPED.

Few, even, of our own citizens, have any knowledge of the magnificent water power that might be developed by the streams which intersect and bound Richmond county.

Richmond county, so called from the Duke of Richmond, a British nobleman, and friend of the rebels of 1776, is, in shape, nearly triangular, lying in the fork marked by Brier and McBean creeks and the Savannah river, and contains about 340 square miles, its longer line being about twenty-five and the shorter fifteen miles. The Savannah river, on its eastern boundary, affords the water power which gives the fall of twenty-eight feet in a distance of nine miles, and the volume of a stream about five hundred yards in width, within the corporation limits of the city of Augusta.

The county is bounded and intersected by the Savannah river, Brier creek, McBean creek, Little Spirit creek, Big Spirit creek, Butler's creek, Cupboard creek, Rae's creek, and Red's creek. We purpose to indicate such prominent sites on the several streams in the county which afford power enough to run a factory of not less than five thousand spindles, saying nothing about the magnificent power of the Savannah river, nor of inferior water power.

*Brier Creek*—This creek affords but a single first-class power, and this is at Mile Haven, in Scriven county.

*McBean Creek*, running on the southwestern edge of the county, makes the boundary between Richmond

and Burke counties. This is a large, bold stream, affording a never failing supply of water. The Augusta and Savannah Railroad follows the course of this creek four or five miles, affording three fine sites, with ample water power for large factories immediately on the railroad. These three sites were formerly occupied, but the dams broken by freshets during the war, have never been rebuilt, and the water power is now idle. At each of these three sites, the power obtained by rudely constructed dams has been put to use in propelling the requisite machinery for large saw mills, grist mills, and flour mills; but nothing like the power which the streams would afford has been made available; the proprietors being satisfied with what would prove sufficient to meet the demands of the machinery in use, and not looking to its fullest development. Following this stream up some seven miles there are three excellent sites, all of which have been used in former days, chiefly to meet the wants of neighboring plantations in grinding corn, but the whole power has never been made available. Seven miles from Palmer's we come to Byne's mill. This power has recently been purchased by Augusta capitalists—buying the plantation adjoining and the mill site for \$13,000—who design, during the coming year, erecting a good flour mill, and a cotton factory, for the purpose of making yarns. A northern agent, who has been inspecting various sites, for the purpose of erecting a thread factory, pronounces this an admirable site. This is the last of the larger mill sites on this stream. There are branch creeks above this point, but they afford only small power.

The next stream north of McBean is Little Spirit creek, a large stream, but so called in contra-distinction to Big Spirit creek, which it joins near Blackwater lake, not far from the Savannah river. There are four admirable sites, well known as Dove's mill, Pemberton's mill, Lawson's mill, and Hancock's mill; of these only Dove's and Hancock's are in use—Dove's as a grist, and Hancock's for a saw mill and merchant mill.

The next stream is Big Spirit creek, a large, bold stream. The first site on this stream is the mill site of R. A. Allen, near the Augusta and Savannah railroad. Not far from this site is the point known as the "last stand," made before the capture of Augusta by the

British, during the revolutionary war, and by the fortifications occupied during the late unpleasantness on that burning march of Sherman to the sea. This is an admirable site, commanding a large volume of water, with ample fall, and is free from back water from the river. This site is only used for a small grist mill and cotton gin, supplied by a short canal, which conveys the requisite volume of water, but not diminishing the volume of the creek perceptibly.

There are a great number of mill sites on this creek for a distance of twenty-five miles up the stream. Next above Allen's is McGee's, affording a first-class water power not used; then follows McDade's, a magnificent site, but only put to the use of a little squatty four post saw mill and grist mill, which disguise nothing of its pretensions to the distant spectator. Next above is Brandon's, and above Brandon's is the well known site of the Richmond factory. The able president of the Richmond factory company, Adam Johnston, Esq., puts his water power to such good use that the stock of his company is never seen in the market. Above the Richmond factory is the excellent sites of Cashin mills, Jeames', McÑair's and Palmer's, besides a number of sites only furnishing power for small mills, which we omit as not first-class power, suitable for factories.

*Butler's Creek*—Upon this creek are the admirable sites of Clanton's, Red's, Carmichael's, Duval's machine works, Belleville factory, McKeiver's, and Crawford's mills. We are not aware that any of these sites are put to use except that occupied by the Duval's machine works company. The Belleville factory was burned during the war, and has never been rebuilt, and its splendid water power now lies idle.

*Rocky Creek*—Upon this creek is Phinizy's mill, Whitney's mill, near the Augusta and Savannah railroad, where the first cotton gin was run by water under the first patent (and we believe the only one) sold by Eli Whitney, the inventor. Next above is Boisclair's, Thomas and Lovell's, all capital sites.

We omit the power of Cupboard, Rae's and Red creeks, as not affording, according to our estimate, first-class water power.

These streams run through a healthy pine region, covered with virgin forests. The country is rolling



and salubrious. No area in the world can surpass it in healthfulness. The markets of Augusta, supplied by the several railroads in operation and projected, giving a close connection with Wilmington, Charleston, Port Royal, and Savannah, secures ample supplies by cheap transportation of manufactures, while its connection with the interior and the West insures supplies of food at a low rate from the West.

*Summerville, Richmond County, Ga.,*

Is situated two and a half miles due west of the city of Augusta, on the eastern slope and summit of what is generally designated "the Sand Hills," by which name the town was known before its incorporation. These hills rise by a gradual slope from the valley of the Savannah river, which here is about two and a half miles in width from east to west, and in length from north to south from eight to nine miles. The distance from the valley to the crest of the ridge is about 2,000 feet; from thence the plateau or summit of the ridge extends in a westerly direction about two and a half or three miles, with an average width of one mile, more or less.

This plateau is, properly speaking, the true summit of the hills in this State, being the highest point attained by it, and upon its eastern terminus is situated a portion of the village, including the United States arsenal and grounds.

The gradual slope of this plateau to the south and east; the sandy nature of the soil, with the pine and oak growth (black jack), make it extremely dry and well adapted for those pulmonary sufferers who require a very dry climate and low dew point; while the sides of the ridge being nearer the valley are better adapted to those for whom a semi-humid atmosphere is necessary. This condition can be in-

creased or diminished by approaching to or receding from the valley, which fact makes the village of Summerville more suitable as a residence for the pulmonary sufferer than any locality I am aware of, since it is well known that though the great proportion of phthisical patients require a dry climate, yet there are occasionally those who are benefited by a comparatively humid atmosphere. This is particularly the case with asthmatic patients, who, in the great majority of cases, are benefited by residing here. As this peculiarity of constitution can only be determined by actual experiment, we have, in the close proximity of these two hygrometrical conditions, an easy and convenient means of determining the fact.

Summerville was originally designed to be simply a summer resort by the wealthy citizens of Augusta, when that city was less healthy than it now is, but its air was found to be so healthful and bracing in winter, that they eventually made it their permanent abode, and now the population may be estimated at eight hundred inhabitants, including servants.

It is regularly laid out in broad streets, lined with handsome elms and other shade trees, the houses being built in large enclosures, ornamented with shrubbery and flowers. It is not uncommon to see the *camellia japonica*, in full bloom, in the months of January and February, while the different azaleas are out in the early part of April.

The salubrity of the climate is unquestioned. As an evidence of its healthfulness, but fourteen deaths have occurred in the place since 1865, though two epidemics—one of small pox and one of measles—have occurred in that time. As far as I have been

able to ascertain, six of the persons were over three score and ten, viz: one aged 102 years, one 94, one 84, one 75, 72 and 70 respectively. Two from accident; one infant from croup; two from congestive fever, contracted elsewhere and neglected, one from pneumonia, contracted elsewhere and neglected; one congestion of the brain; one ascites; one tuberculous phthisis, developed elsewhere.

During the prevalence of that fatal epidemic, the yellow fever of 1854, which infested our coast towns and even penetrated to villages which before had escaped its ravages, it finally made its appearance in the city of Augusta. Although an easterly wind prevailed for sixty days, before and during the epidemic, and consequently blowing directly to the hill across the city, there is no reason to suppose the atmosphere of Summerville was at all contaminated with the poison of this pernicious fever, since no cases occurred here other than those contracted in the city, or by close confinement with those cases which were developed in the village.

The residence of Col. John Milledge, which stands upon the most prominent situation due west of Augusta, and nearer to the city than any other house in the village, was crowded with refugees from Savannah and Augusta, who, including their servants, and the family, numbered about sixty persons, yet among these not a single case of sickness of any kind occurred.

The same exemption from causes of disease, claimed for other portions of this region, applies to this village, and though malarial fevers exist in the valley and close upon its borders to some extent, yet the hill proper, upon which most of the village

stands, is entirely exempt from this influence, being in every respect as healthful as Aiken, Columbia, and Camden, in South Carolina, and Belair, Berzelia, Bath, and other sand hill villages in this State.

To the lovers of the picturesque, the views from the various prominent points of the village are beautiful in the extreme, and so distant is the horizon as to require very little exercise of the imagination to fancy the wide expanse of the ocean spread out before the eye, while the broad valley upon which stands the city, bounded by undulating hills, give a charm and variety to the landscape seldom found even in mountain scenery.

From the plateau upon which Col. Milledge's residence stands the view is more extensive than at any other point, and therefore this spot has been suggested as one of the best sites for a first-class hotel. An enterprise of this character would be beyond all question amply remunerative, since it is a matter of daily experience, that during the winter and spring months there have been hundreds of unsuccessful applicants for accommodation at the few houses open to those fleeing from the rigors of a northern climate, and desiring a temporary sojourn in the more genial atmosphere of the south.

This village, being connected with the beautiful and growing city of Augusta, by a street railroad, the cars of which run at frequent and regular intervals between the two places, the time occupied being about thirty minutes, affords the residents of Summerville all the advantages of the city market, together with the quiet and beauty of a suburban residence. A good turnpike also offers inducements for pleasant drives to those who keep their equipages.

To the pedestrian the fragrant pine woods in close proximity to the village, not only afford protection from the winds, but also opportunities of agreeable recreation and healthful exercise. These advantages in connection with others which will readily suggest themselves, make this a most desirable residence for those who may wish to avail themselves of the remedial influence of the climate, as presented for their consideration in the preceding pages.

The easy access of this point by rail from the sea coast, the beautiful and bracing nature of the climate, would make a favorite summer resort for the people of this section, were a first-class hotel built here; while in winter there is no question of its being a largely paying investment. And as the beneficial influence of the climate comes to be more known by the large class of northern people who now migrate every autumn and winter to Florida, they would naturally resort to this place, particularly in the early spring months.

In consequence of failures in business, the loss of property, and the necessity of changing locality, there are now several places put upon the market for sale at very moderate prices, but real estate is here rising in value every season, so that it may soon be expected to reach its original *ante-bellum* price. The present is, therefore, the best time for purchasing, and any one desiring to do so can obtain all necessary information from Messrs. L. & H. A. McLaws, Land Agents, Augusta, Ga.

Nov. 21, 1891



# LAND AND MINING AGENTS

FOR THE STATE OF GEORGIA.

---

L. & A. H. McLAWS,

NO. 3 OLD POST OFFICE BLOCK,

AUGUSTA, GA.,

WILL BUY AND SELL

## REAL ESTATE

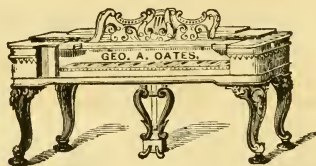
ON COMMISSION.

---

### REFERENCES:

Gen. E. C. Anderson, Savannah; Hon. John P. King, John Bones, and Thos. P. Stovall, Augusta; Gen. W. T. Wofford, Cartersville, Ga.; Gen. Robert Toombs, Washington, Ga.; Maj. R. J. Moses, Columbus, Ga.; Pratte, Edwards & Co., Atlanta, Ga.; Hon. B. C. Harris, Sparta, Ga.; Hon. John W. Stevenson, Governor of Kentucky; Hon. A. W. Newby, President Bank of Ky.; Col. E. T. Taylor, Cashier Bank of Ky.; Hon. W. T. Barrett, Louisville, Ky.; Gen. U. S. Grant, Gen. W. S. Hancock, Gen. C. W. Fry, U. S. A.; Gov. M. Bonham, Gen. J. B. Kershaw, S. C.; Gen. D. H. Hill, Gen. R. Ransom, N. C.; Col. St. George Rogers, Col. F. Dancy, Fla.; Gov. B. T. Humphreys, Miss.; Gen. A. P. Stewart, Gen. G. W. Smith, Tenn.; Gen. J. D. Imboden, Va.; Col. C. D. Pennebacker, Washington, D. C.

# OATES'



## PIANO & MUSIC ROOMS

ESTABLISHED IN CHARLESTON 1835.

" IN AUGUSTA 1848.

Where can be found PIANO FORTES unsurpassed for elegance of finish, great power, singing qualities, sweetness and purity of tone, and of great durability.

EVERY INSTRUMENT WARRANTED FOR 5 YEARS.

Sole Agent for the factories of A. WEBER, HAINES BROS., and NORVESON & SON, New York, and several others.

Also, Agent for MASON & HAMLIN'S superior CABINET ORGANS.

Always on hand a large assortment of GUITARS, VIOLINS, ACCORDEONS, and all kinds of MUSICAL MERCHANDISE.

A large collection of School and Miscellaneous BOOKS, and every thing appertaining to a first-class Book Store can be found at the establishment of

GEO. A. OATES,

240 BROAD STREET, AUGUSTA, GA.

OLD DRUG HOUSE.

---

**Plumb & Leitner,**

212 Broad St., Augusta, Ga.

---

P U R E

**Medicines and Chemicals,**

DRUGS, PAINTS, OILS,

GLASS, BRUSHES, PUTTY,

PERFUMERY, FANCY GOODS, TOILET ARTICLES.

Warranted Fresh

GARDEN SEEDS,

*Fish Hooks, Lines, Poles, and a general assortment of  
Fishing Tackle.*

WHOLESALE AGENTS FOR THE CELEBRATED

MILLVILLE ATMOSPHERIC FRUIT JARS.

PLUMB & LEITNER,

NEW GRANITE FRONT, BROAD STREET, AUGUSTA, GA.

PRINTED AT THE AUGUSTA PRESS BOOK AND JOB OFFICE.

---

*Millstream Institution -*  
*From the Author.*

*Eastern Georgia*

HEALTH AND PROFIT:

AS FOUND IN THE

HILLY PINE REGION

OF

GEORGIA & SOUTH CAROLINA.

TOGETHER WITH AN ACCOUNT OF ITS

HORTICULTURAL, AGRICULTURAL, AND  
MANUFACTURING RESOURCES,

AND THE

TOPOGRAPHY, GEOLOGY, BOTANY, AND CLIMATOLOGY  
OF THE REGION.

BY S. E. HABERSHAM, M. D.

AUGUSTA, GA.

PRINTED AT THE AUGUSTA PRESS BOOK AND JOB OFFICE.  
1869.





















LIBRARY OF CONGRESS



0 014 418 738 6 ●